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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

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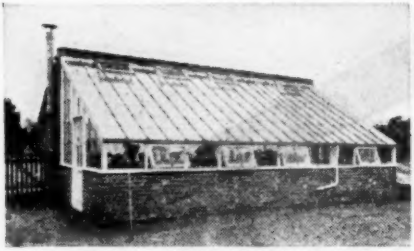

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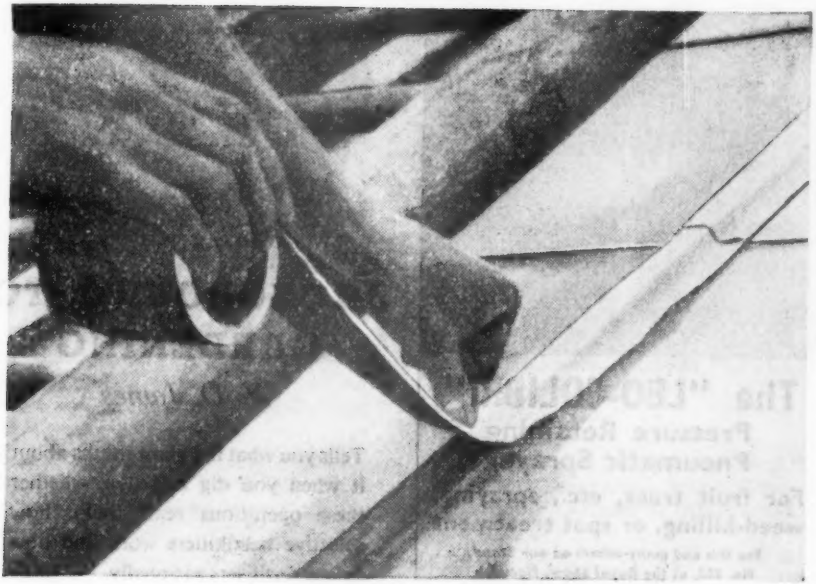

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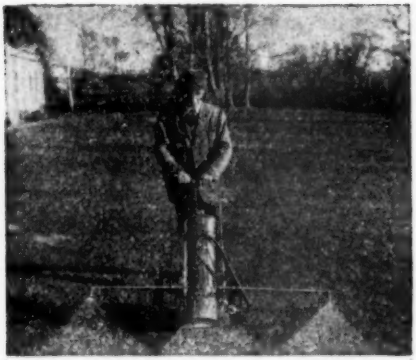

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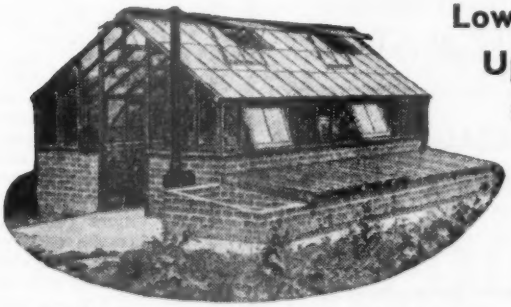

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4 ft. Heavy	500	7/3	13/–	24/4	107/6
5 ft. Med.	500	8/3	14/10	26/4	115/6
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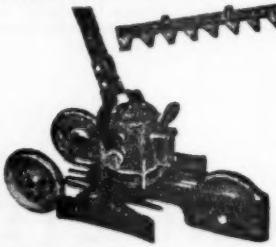

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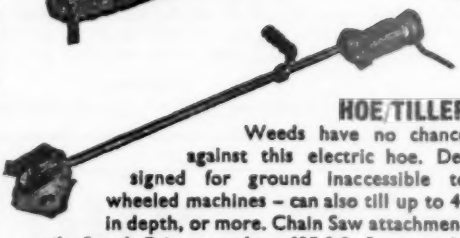

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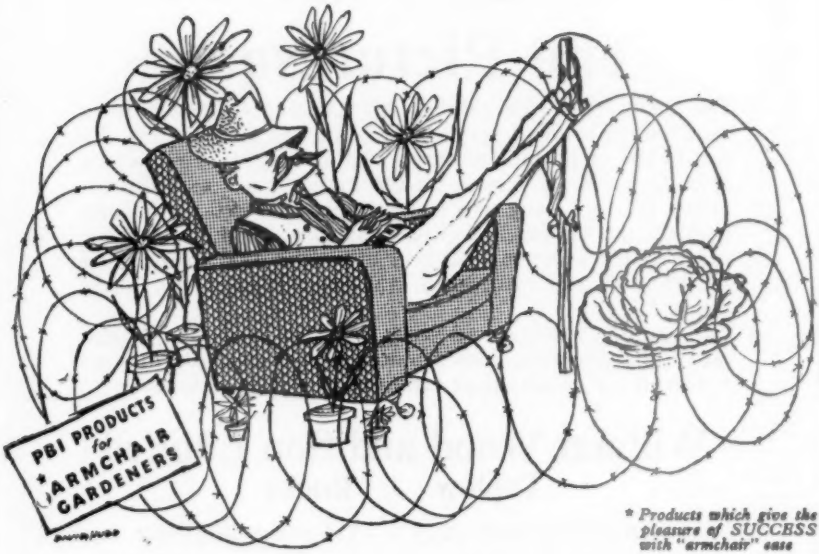

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JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXXII PART SEVEN

July 1957

THE SECRETARY'S PAGE

ANNOUNCEMENTS—JULY AND AUGUST

Shows—The Society's Fortnightly Shows are held in the Society's New Hall in Greycoat Street and/or the Old Hall in Vincent Square, Westminster.

TUESDAY, July 2 12 NOON to 6 P.M. WEDNESDAY, July 3 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall. British Delphinium Society's Show, in the Old Hall.
TUESDAY, July 16 12.30 P.M. to 6 P.M. WEDNESDAY, July 17 10 A.M. to 5 P.M.	Fortnightly Flower Show and Fruit and Vegetable Competition, in the New Hall.
TUESDAY, July 16 12 NOON to 7 P.M. WEDNESDAY, July 17 10 A.M. to 5 P.M.	British National Carnation Society's Show, in the Old Hall.
TUESDAY, July 30 12 NOON to 6 P.M. WEDNESDAY, July 31 10 A.M. to 5 P.M.	Fortnightly Flower Show and British Fuchsia Society's Competition, in the New Hall.
TUESDAY, August 13 12 NOON to 6 P.M. WEDNESDAY, August 14 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall. Gladiolus Competition in the Old Hall.
TUESDAY, August 27 12 NOON to 6 P.M. WEDNESDAY, August 28 10 A.M. to 5 P.M.	Fortnightly Flower Show, Alpine Garden Society's Competition and Cactus and Succulent Society's Competition, in the Old Hall.

Lectures

TUESDAY, July 2, at 3 P.M. "The Modern Delphinium", by MR. R. C. PARRETT.

TUESDAY, July 16, at 3 P.M. "Apple Scars and Blemishes", by PROF. H. W. MILES, M.SC., D.SC.

TUESDAY, July 30, at 3 P.M. "Mist Technique Propagation", by MR. F. P. KNIGHT, F.L.S., MR. F. E. W. HANGER, V.M.H., and MR. A. G. M. BEAN, M.A., A.M.I.MECH.E.

TUESDAY, August 13, at 3 P.M. "Changing Fashions in Roses", by Mr. G. D. ROWLEY, B.SC.

Demonstrations at Wisley—The following demonstrations will be given at Wisley; that on the succeeding day or days being in each case a repetition of that given on the first.

JULY 3–4. Summer Pruning of Fruit Trees. (Commencing at 2 P.M.)

JULY 17–18–19. Vegetative Propagation of Shrubs and Herbaceous Plants. (Commencing at 2 P.M.)

Co-operative Display of Lilies—There will be a co-operative display of lilies at the Fortnightly Show on July 16 and 17. Members of the Lily Group are invited to bring or send lilies for this co-operative exhibit, and SIR FREDERICK STERN, the Chairman of the Group, has kindly undertaken to supervise the staging. Any Member who would like to supply flowers for this exhibit is asked to let the Secretary of the Lily Group know, on or before the preceding Wednesday, the names of the lilies he proposes to supply and the number of stems, so that the necessary arrangements in regard to space, etc., may be made, and cards prepared showing the names of the lilies and the names of the exhibitors.

Lily Group Meeting—There will be a discussion at 4.30 P.M. on Tuesday, July 16, in the Restaurant of the Old Hall, on "The Lilies Exhibited".

At 7 P.M. on the same day, Members of the Lily Group and their friends will dine together in the Restaurant of the New Hall.

Floral Arrangement Competition—There will be a Floral Arrangement Competition on Wednesday, October 2. Schedules may be obtained on application to the Secretary.

Flower Fair—Flower Arrangements will be a feature of a Flower Fair and Garden Party in aid of the Marie Curie Memorial Foundation, which will be held at Marlborough House on July 10 and 11, by the gracious permission of HER MAJESTY THE QUEEN. Particulars may be obtained from The Organizer, 38 Chester Square, London, S.W.1.

Film of South African Flowers—MR. B. L. CHAMBERS will show a film of South African wild flowers in the Lecture Room at 3 P.M. on Wednesday, July 17. Fellows of the Society are invited to attend.

Second World Orchid Conference—This Conference, which is jointly sponsored by the University of Hawaii, the American Orchid Society Inc., and the Hawaiian Orchid Societies Inc., will be held in Honolulu, Hawaii, from September 19 to 23, 1957. It is intended primarily for the exchange of information and for the observation and comparison of orchid cultural techniques. The nomenclature and registration of orchid hybrids will also be discussed. There will be an exhibition in which *Vanda* and *Dendrobium* hybrids are expected to be particularly prominent, and tours to some of the islands' outstanding gardens and orchid nurseries are planned. Full particulars may be obtained from DR. J. H. BEAUMONT, Chairman of the Joint Planning Committee, University of Hawaii, Honolulu 14, Hawaii.

NOTES FROM WISLEY

MANY fellows will receive their first bulb catalogue early in July, if not before, and so it is proposed this month to digress from the discussion of July-flowering plants usual for this month and to include a few notes on some of the tulips and other plants. In front of the Curator's house to the left of the entrance the border of bronze and yellow wallflowers with the large pink, lily-flowered tulip 'Mariette' remained in flower for an exceptionally long period this year, at least four weeks. Probably the cold spell we experienced early in May served to keep the flowers in condition while not being bad enough to destroy them. Undoubtedly this tulip is outstanding for size and form of flower while the colour is also pleasing and several years of experience indicates that it is a vigorous grower. In the formal beds in the main walk the old cottage tulip 'G. W. Leak' with flowers of brilliant geranium-lake was very fine, while the newer 'Queen of Bartigons' with pale salmon-pink flowers was a lovely sight. The slight shelter afforded by the hornbeam hedge along the edge of the trial grounds left the tulips in flower on that side noticeably longer than those on the other side of the walk. In the tulip trials were also a number of very fine varieties and they attained their full size and height rather slowly this season. The pale lilac-mauve 'Elizabeth Erikson' was particularly good as was the pure white 'Snow Peak'; the pale creamy yellow 'Niphetos' and its darker yellow sport 'Golden Niphetos' attracted attention as late as the middle of May. The Darwin hybrids, in the breeding of which *T. fosteriana* was included, flowered earlier and provide a useful precursor for the cottage and Darwin tulips. Undoubtedly they are very magnificent, a strong reddish scarlet in colour, with very large flowers and for garden purposes it is difficult to choose between them, but 'Apeldoorn' and 'London' are certainly among the best. The silky satin-like sheen on the inner side of the petals and the slight bloom on the outside of the flowers gives them an unusual distinction. They appear also to be strong and vigorous growers and undoubtedly should prove a great

addition to the colour in our spring gardens. The report of the tulip trials, giving much fuller details, will be published in a later issue. Methods for the control of fire disease included the dusting of bulbs and beds before planting with a derivative of parachlornitrobenzine and, when the foliage had emerged from the ground, spraying every ten days with Captan, and this appears to have established a reasonable control.

The broad borders leading up to Battleston Hill were newly planted last autumn and this spring with a collection of herbaceous plants and shrubs and during July these should have many interesting herbaceous plants in flower, although the full value of the shrubs will not be reached for several years yet. The various forms of the yellow *Potentilla fruticosa*, however, flower as small shrubs and are worth noting since they remain in flower for a very long season, practically throughout the late spring and during the whole summer and are particularly suitable for small gardens. The varieties called 'Katherine Dykes' and *arbuscula* with golden yellow flowers and *vilmoriniana* with pale creamy yellow flowers and silvery foliage can particularly be recommended. A number of floribunda roses have also been included in large groups to provide summer colour and it is hoped that these borders of mixed shrubs and herbaceous plants will prove interesting and useful to Fellows as showing the kind of border which may have some interest through a very large part of the year and also be somewhat easier to maintain than the pure herbaceous border.

The trials of hardy hybrid rhododendrons flowered particularly well this year and the opening up of the lower part by the cutting away of much of the hedge of *R. luteum* has certainly made both these and the Kurume azaleas on the other side of the broad walk easier to see.

The azalea trials also flowered well on the slope facing the Portsmouth road and it was satisfactory to note that a number of the Wisley raised seedlings stood up well to the competition. Among others which were specially noted were 'Albatross', white with a yellow blotch, which received an A.M. in 1953, 'Farall Yellow' with large trusses of deep yellow flowers slightly frilled at the edge and, in the beds by the rhododendron species collection, the orange-flame coloured 'Speks' Orange' with large globular trusses of flowers. This received an F.C.C. in 1953. A number of the Wisley raised seedling rhododendrons were also flowering and among these 'Billy Budd' (*R. elliotti* × 'May Day') was a particularly fine, deep blood red.

Among the azaleas and rhododendron species a number of lilies have been planted and these should be making a fine show in July. The Bellingham hybrids do particularly well on this site and the yellow 'Royal Favourite' is a very attractive member of this group. Strong spikes of *Lilium auratum* and of a number of New Zealand raised crosses of *L. auratum* with *L. speciosum* also promise well. Hostas and other plants with fine foliage have also been planted in this part of the garden and these are very useful plants for ground cover and consequent saving in weeding and labour.

PLANTS OF INTEREST AT WISLEY DURING JULY

LABORATORY WALLS AND PONDS

Abutilon megapotamicum
Ceratostigma willmottianum
Nymphaea 'Escarboucle'
" 'Sunrise'
Senecio laxifolius

GLASSHOUSES

Cuphea micropetala
Datura chlorantha
Fuchsias in variety
Gloriosa rothschildiana
" *superba*
Hibiscus in variety
Ipomoea rubro-coerulea
Pelargoniums in variety
Solanum wendlandii
Succulent plants

WILD GARDEN

Eucryphia glutinosa
" × *nymansensis*
Hydrangea sargentiana
Lilium (*Cardiocrinum*) *giganteum*
" *pardalinum*
Magnolia virginiana
Primula florindae
Rhododendron auriculatum
Tropaeolum speciosum

SEVEN ACRES

Aesculus parviflora
Buddleia davidii varieties
Butomus umbellatus
Catalpa bignonioides
Genista cinerea

SEVEN ACRES—(*cont.*)

Escallonias in variety
Gunnera manicata
Heaths in variety
Philadelphus in variety
Pontederia cordata

ROCK GARDEN AND ALPINE HOUSE

Campanulas in variety
Codonopsis in variety
Gazanias
Gentians in variety
Geranium dalmaticum
Iris kaempferi varieties
Lobelia fulgens
Osmunda regalis

WEATHER HILL

Annual border
Cistus in variety
Herb borders
Rose borders

FLORAL TRIAL GROUNDS

Trials of Delphiniums
" " Dianthus
" " Gladioli
" " Hemerocallis
" " Sweet Peas

BATTLESTON HILL

Eucryphia species
Hostas in variety
Hypericum patulum 'Hidcote'
Lilies in variety
Potentilla fruticosa varieties
Rhododendrons in variety

INVITED TRIAL OF IRISES

It has been decided that the trial of bearded irises, which is to be planted at Wisley this summer, shall consist of two sections:

(*a*) dwarf varieties—not exceeding 9 inches in height, and
(*b*) intermediate varieties—over 9 inches but not exceeding 20 inches in height.

Anyone wishing to submit a variety or varieties for trial should apply to The Director, The Royal Horticultural Society's Gardens, Wisley, Ripley, Woking, Surrey, for the requisite form or forms *without delay*.

DAMAGE FROM HORMONE WEEDKILLERS

Prof. R. H. Stoughton, D.Sc., V.M.H.

THE increasing use of the so-called "hormone" weedkillers for the treatment of cereal crops, lawns, paths and similar purposes has led to many cases of accidental damage to neighbouring crops and it is important that all who use these substances should be aware of the risks involved not only to their own fields and gardens but also to their neighbours'. It must be remembered that in law you are liable for spray damage to your neighbours' crops even though you have not yourself been negligent.

The special property which makes these compounds hazardous is that while they are relatively harmless in low concentration to grasses or cereals and many other monocotyledonous plants they are toxic in minute quantities to most broad-leaved plants and furthermore the appearance of injury is usually delayed for a week or more, which makes the attribution of cause to one particular operation by a neighbour very difficult.

For garden use hormone weedkillers are usually prepared in liquid form for spraying or watering on lawns or suitable crops, but in some cases they are used as dusts, and there are preparations on the market in which they are incorporated in lawn sand or lawn fertilizer. If used as a spray it is most important to remember that a fine mist spray or a dust may drift long distances in quite light winds and damage to vegetable and flower crops may result many yards from a lawn under treatment. Spraying or dusting should never be carried out except on a still day and for lawn treatment it is better to use a watering-can with a fine rose rather than a sprayer. In any case it is important to keep well clear of herbaceous borders or vegetable plots. All the brassica crops, cabbage, cauliflower, Brussels sprouts, turnips and so on, are particularly susceptible.

There is some evidence that certain preparations of this kind are volatile, especially in hot weather, and damage in glasshouses has been attributed to the vapours from treated paths and lawns drifting in through ventilators. A further risk, particularly following the treatment of field crops, is the possibility of dust from soil previously treated blowing over other crops.

If a lawn is mown soon after treatment the cuttings should not be used for mulching roses, shrubs or herbaceous plants. Care should be taken when spraying not to contaminate ponds, streams or water-courses.

It is advisable when possible to keep a special watering-can or sprayer for use with weed-killers as it is difficult to free them completely from traces of the chemicals after use. If such a utensil must be employed for ordinary watering or spraying it is essential to wash it out with several changes of water to which small quantities of a detergent

have been added and, if possible, to leave it full of water overnight before use.

If these precautions are carefully followed there is no reason why hormone weedkillers should not be used and they undoubtedly are of the greatest value in freeing lawns of weeds and, provided they are applied annually, in maintaining a weed-free condition thereafter.

HELLEBORES

E. B. Anderson, M.Sc.
(*Veitch Memorial Medallist*)

(*Lecture given on April* 30, 1957, THE HON. LEWIS PALMER, F.L.S., V.M.H., *in the Chair*)

THE CHAIRMAN in introducing the lecturer said that he was sure that those who took an interest in the cultivation of hellebores would greatly welcome MR. ANDERSON'S paper. The difficulty they all expressed in identifying plants belonging to this genus appeared to arise from the fact that the learned German monographs on hellebores both used the shape of the leaves as critical characters in their keys. His experience was that a most indefinite variety of shapes was covered by the German terms "fussformig" and "handformig". The other great element of confusion was the presence in our gardens of a host of hybrids which had originated in Central European gardens and which had been brought to this country under specific names to which they had no title. He very much hoped that MR. ANDERSON'S paper would do something to help gardeners in deciding whether their plants were species or hybrids.

MR. E. B. ANDERSON: Although I am much honoured by the Council's invitation to give this lecture, I approach the subject with a certain degree of trepidation. The reason being that some of the species, particularly the more ornamental, hybridize very readily, and many, not excluding the botanic gardens, labour under the delusion that they possess this or that species or special form, whereas I am sure they do not.

However, although I am no botanist, I hope I shall be able to shed light on the subject, from the point of view of the gardener. Apart from this it may be particularly appropriate that I should tackle this subject, for this is what that old rascal PARACELSUS says: "The Black Hellebore is good for those of older years (i.e. over fifty). Gathered when the moon is in one of her signs of conservation, dried in an east wind, powdered and mixed with its own weight of sugar, it renders old people younger and more vigorous."

Interesting as this recipe may be to some of us, there are other reasons why one should grow hellebores. What other herbaceous plant

can give such a display of attractive blooms throughout the winter? In addition all the species and hybrids are quite hardy excepting perhaps *Helleborus lividus*. All are easy to grow if certain reasonable conditions are provided. There is a considerable range of colour and markings, none brilliant, but perfectly adapted to the winter scene as are the flowers themselves to withstand winter storms.

Apart from the glistening Christmas rose, some, perhaps, regard the colours as unattractive, dull or "arty"; to such the hellebores cannot appeal, they must await the splendours of the tulip or the dahlia.

Although most of the plants grown in gardens nowadays as Lenten roses are hybrids, there is, I find, an increasing interest in the species themselves. I hope, therefore, that those of an enquiring mind will welcome some account of these and their relation to the hybrids. Moreover, it seems likely that further advances, if thought desirable, will depend on the use of those species which have, so far, to a great extent, been neglected.

I propose therefore to summarize the species in as simple a way as possible. For this I have depended mainly on the monographs by PROFESSOR E. ULBRICH and DR. V. SCHIFFNER. The former, as far as I know, is not available in translation in this country but there is a useful translation of the latter by PAUL ROSENHEIM in *The New Flora & Sylva*, Vol. XI, p. 74, 1939. Where these two authors do not agree I have accepted the conclusions of the former as being the latest publication, except where stated. I may be wrong to do so, but as I have already stated I am not a research botanist. Botanical details are also given in the *R.H.S. Dictionary of Gardening*, Vol. II, p. 978.

In dealing with the species I have included only such synonyms as appear to be in present use with gardeners.

It is hardly necessary to describe the hellebore flower but it does exhibit several points of general interest which may be worth recording. The flowers are pendent or nearly horizontal, a wise precaution to protect the reproduction organs in winter. There are five tepals, two outer and three inner, in the species the two outer ones always exhibit more green colour than the inner three. The tepals are persistent until the seed is ripe, and become greenish with age. There are numerous nectaries at the base of the flower and there may be anything up to 150 stamens. The anthers ripen in succession, over a period of weeks, from outside, inwards. Another wise precaution. There are three to ten styles and carpels, many of which may not produce seed. The leaves may be palmate or pedate or anything between and evergreen or deciduous.

There are probably twenty species in all, ranging from England, South and Central Europe and the Balkans to Turkey, the Caucasus and beyond. There are no species in Scandinavia or Russia except the south-east and none in most of Asia, Africa or America.

For the benefit of those who might have the desire and opportunity of collecting the following table has been compiled.

TABLE I

H. vesicarius	N. Syria, S.W. Turkey.
H. foetidus	England, Belgium, Holland to Pyrenees and Spain.
H. corsicus	Corsica, Sardinia, Balearics.
H. lividus	Balearics only.
H. niger	S. Europe, Austria (Carinthia, Styria, Jugo-Slavia).
H. niger macranthus	S. side French Alps to S. Tirol, Italian Alps and Apennines, Carinthia, Croatia, Jugo-Slavia, possibly N. Greece.
H. orientalis (*H. kochii*, *H. caucasicus*)	S.E. Black Sea, S. Caucasus and further east.
H. abchasicus (*H. colchicus*)	S.E. Black Sea.
H. guttatus	Georgia.
H. antiquorum (*H. orientalis*, *H. olympicus*)	W. Turkey, Bithynian Olympus.
H. olympicus	W. Turkey, Bithynian Anatolia.
H. cyclophyllus	Greece, Macedonia, Turkey in Europe.
H. odorus	Widely spread in S.E. Europe.
H. multifidus	Balkans.
H. bocconii	Central and S. Italy, Sicily.
H. viridis	Europe.
H. viridis occidentalis	W. and S.W. Europe, England.
H. dumetorum	Hungary, Balkans, etc.
H. atrorubens	Hungary, Balkans, etc.
H. purpurascens	Hungary, Balkans, etc.

The hellebores are divided into two main groups, the caulescent which includes *H. vesicarius*, *foetidus*, *corsicus* and *lividus*. These all have an annual stem surmounted by flowers, which may range from a foot high in *H. lividus* or several feet in *H. corsicus*, and the stemless or acaulescent which includes all the rest.

THE SPECIES

H. vesicarius is a very rare plant in cultivation with aconite-like leaves and is characterized by the very large bladder-like seed capsules 2½ inches long. The flowers are of little attraction, being yellowish-green, 1½ inches across, tipped or partly coloured with maroon-purple.

H. foetidus is a well-known plant with beautifully cut very dark green pedate leaves contrasting with the heads of small pale green pendent flowers, edged more or less with purple brown on stems 1 to 1½ feet tall (Fig. 87). On ripening the colour changes to a bright green which is equally handsome. It may become a weed but nevertheless is a beautiful plant and particularly useful in the wild garden.

H. corsicus, I believe, should now revert to its old name of *H. argutifolius*, but I think for the moment we will retain the former. Everybody

knows this plant with its 1½ to 2 feet stems clothed with handsome serrate, trifoliate leaves veined in paler green and each stem surmounted with a panicle of light yellow-green, cupped flowers about 1½ inches across. In rich soil this plant grows taller, but then, because of the heavy heads of flower, requires staking, which to me, gives it an unnatural appearance. Two new growths usually appear from the base of each flower stem and so in time a lovely mount of foliage and flower requiring no staking is formed. Overfed plants also appear to be short-lived.

H. lividus is, I believe, now regarded as a sub-species of *H. corsicus*. It is a much dwarfer plant, usually less than a foot high, the leaves are trifoliate but either not at all or only slightly toothed. They are marbled in paler green to almost white and are a livid purple beneath. This same colour suffuses the pedicels and flowers to a varying degree and darkens with age. The true plant does not seem as hardy as its relative but its hybrids are hardier and more perennial. These will be dealt with later.

Now we come to the acaulescent species of which the best known is the Christmas rose, *H. niger*.

In the literature of this group great stress is laid on the divisions of the leaves, even in *H. niger*. An examination of herbarium specimens proves that this is an extremely unstable character and by no means to be depended upon in determining the species except with a very wide interpretation.

H. niger has, as all know, evergreen leaves and pure white flowers usually 2 to 3 inches across but even 5 inches has been recorded and one very small-flowered form has been listed as *minor*. The flowers are usually borne singly on stems peppered with red spots, sometimes the flowers are suffused wth pink. After flowering the tepals become green, sometimes with a reddish tint. It is evidently a variable plant in the wild as imported forms have been named *minor*, *major* and *angustifolius* ('Warde Lodge var.') (Fig. 86).

H. niger macranthus (*H. maximus*, *H. altifolius*) is a recognized subspecies which is dwarfer in habit but has larger flowers without any pink suffusion (Fig. 85). The leaves overtop the flowers and the stems are usually unspotted, moreover the leaves are a bluer green. The largest flowered forms I have seen come from the Italian alps above Lake Garda. The two forms meet in their eastern habitats.

It will be noted that I have given *H. altifolius* as a synonym of *H. macranthus* in which the leaves overtop the flowers, whereas most people regard as *H. altifolius* a plant in which a tall flower stem overtops the leaves. This incorrect naming may have been due to a defaced label or a lack of knowledge of Latin by someone. It is extraordinary how long this error has persisted. All the herbarium specimens I have examined show this character of leaves above the flowers.

In 1886, according to F. W. BURBIDGE, curator of Trinity College garden, Dublin, no less than eight forms of *H. niger*, so called, were in cultivation. Some apparently collected in the wild and some no doubt

seedlings. Names such as 'St. Brigid', 'Mme. Fourcadé', and 'The Bath', 'Riverston' and 'Brockhurst' vars. as well as the forms previously mentioned were common in my youth. The 'St. Brigid' (and the 'Brockhurst' form which is identical), is a form of *H. niger macranthus*. The name was given to the plant by F. W. BURBIDGE who saw it growing in the garden of a MRS. LAURESTON, of Howth, Dublin. At the time it was regarded as the most beautiful of all. That 'St. Brigid' was a *macranthus* form receives confirmation from a note in *Gardeners' Chronicle*, January, 1884, which is as follows: "Walking with a friend in his garden this week, a lowly mass of deep green foliage of a rather peculiar aspect arrested attention, and, for the moment puzzled, we asked what it was. 'That's St. Brigid's Christmas Rose', said our friend, and then stepping on the border and dividing with his hands the curtain of greenery which completely concealed them, and at the same time effectually prevented their defilement from rain or otherwise, a revelation of floral beauty took place which made one stare and stop long to admire. This revelation took the shape of a nest of flowers of spotless white, numbering some dozens, and individually measuring more than 2 inches across" (from *Irish Farmers' Gazette*).

In the same number of the *Gardeners' Chronicle*, W. BROCKBANK, of Didsbury, a noted grower of hellebores, says of this variety: "This Hellebore appears to have been established for many years in English gardens. Its deep roots make it most at home in light soils and it probably obtained a footing in Holland from this peculiarity and was brought thence to England as far back as the reign of QUEEN ELIZABETH by the Dutch Gardeners who were then employed in English gardens."

This and others may still exist in some old gardens but many seem to have died out, perhaps from overfeeding. In Victorian days they were usually grown in the kitchen garden and no doubt heavily manured with the apple trees as was the practice then. As they are easily raised from seed, and the seedlings vary, the loss is not so serious as it may appear, but I would like to find DE GRAAFF'S variety, said to open pure white and change to pale primrose!

At one time they were grown commercially for the Christmas trade. CANON ELLACOMBE refers to Christmas rose farms from which thousands of flowers were sold, as also does W. BROCKBANK in reference to the market gardeners of Cheshire.

Forms in which the whole flower, on opening, is suffused with pink have occurred from time to time. T. SMITH, of Newry, had one of a soft red colour with the build of *H. niger macranthus*. They seem to have a poor constitution as there is no evidence of their having been widely distributed. I recently had a seedling of this colour, but "it died on me" and seed from it failed to germinate. Some seedlings produce flowers with pointed tepals, the effect being very like a white *Odontoglossum*, which I regard as very attractive, forms with crimped tepals also appear. A semi-double form was once found in Lower Austria, the source of the earlier importations.

It may be news to others as it was to me that there are two species in China—*H. chinensis*, said to be reddish-white, and *H. thibetanus*. I have seen no herbarium specimen of the former but I have of *H. thibetanus*, obviously in the *viridis* group, but said to be red and beautiful. This I do not understand for a *viridis*, but when a botanist says a plant is beautiful, it must be something exceptional (as ULBRICH describes the latter).

We now come to the Euhellebores of SCHIFFNER, the most important group from the garden point of view, as from these the numerous hybrids, collectively known as Lenten roses and sometimes incorrectly as *H. orientalis*, have been derived.

I shall deal first of all with those species which have played the major part in this development. The descriptions are based mainly on specimens in my own garden, which I believe to be true. These will be followed by the green-flowered species which up to the present have played little or no part in this development. The synonyms are in brackets.

H. orientalis (*H. kochii*, *H. caucasicus*). This plant can always be distinguished by its very large palmate leaves up to 16 inches across, which are evergreen. The flowers on 15-inch stalks are nearly 3 inches across and almost horizontal. They open cream, fade to a brownish colour. They have no spots. There are two forms, the type with some pubescence on the veins of the undersurface of the leaves and the other var. *glaber* without. The latter, originally collected in the Caucasus grows only about 12 inches high and the flowers are greener than in the type, and the leaves smaller and shiny.

H. abchasicus (*H. colchicus*). This is a very variable plant with perennial palmate leaves and 2½–3-inch flowers, drooping, maroon or reddish-purple, the tepals internally heavily peppered with small darker spots. I have a form in which there is red in the edge of the leaf and in some forms the carpels are also tinged with red.

When at Tooting, Barr's were reported as having a form with blood-purple leaves and deep crimson flowers.

H. guttatus. In this species the large flowers are white with the tepals heavily marked internally near the base with large carmine red spots. The leaves are palmate and perennial. I cannot say more at present as the true plant has not yet flowered with me.

H. antiquorum (*H. orientalis*, *H. olympicus*). Leaves perennial, characteristically serrate, flowers horizontal about 2½ inches across, no spots. Colour greenish-white alone or tinged with lilac at the top of the tepals, inside and out. The depth varies with the season, at least with me. Both forms are figured in old colour plates in *The Garden* and the *Botanical Register*. This plant is closely allied to the next.

H. olympicus (*H. caucasicus pallidus*). Leaves perennial, palmate, flowers large 2½–3 inches in pure white, green at base, pendent, no spots. Never any pink or lilac on tepals. This is probably the black hellebore of the classics.

H. atrorubens (*H. cupreus*). This is the plant which masquerades in

gardens as *H. niger roseus* or as a *H. niger* × *H. orientalis* hybrid. It is no such thing. Its garden characteristic is that it is the first coloured species to flower, appearing at or about Christmas or early January. The palmate leaves are very variable in size and are not naturally evergreen, but in our mild winter persist up to flowering time. The flowers are also variable, usually a deep maroon with a violet tinge about 1½ to 2 inches across and as they age they become more violet.

The monographs describe the colour as muddy violet which is an example of how botanists may be misled by the colour of dried specimens.

The above covers all the coloured species and we now come to those with green or yellowish-green flowers. Many of these are of garden worth to those who do not expect everything to be brightly coloured.

H. odorus. A charming plant with medium-sized, about 2 inches across, round yellowish green flowers on foot-high stems and perennial palmate leaves. ROSENHEIM'S translation of SCHIFFNER gives the flower as 3½ inches across. This seems extraordinarily large and my specimens are never more than two. In view of its wide distribution such a form may exist and if so it is most desirable that it should be introduced. To some it has a pleasant scent of elder flower, to others, black-currant.

H. cyclophyllus. This is the largest green-flowered species I have seen, the round blossoms are about 2½ inches across and pure bright green. The leaves are not perennial, by which means it can be distinguished from *H. odorus*, also by larger size of flower and colour. This species is also said to be sweet-scented but I have no record.

The remaining green-flowered species have small flowers and are of less horticultural value, but of considerable interest.

H. multifidus. Has much divided pedate leaves, not perennial with me, flowers bluish green about one inch across with pointed tepals. This plant has sometimes been distributed in the past under the misapplied name *H. bocconi*, which should belong to the plant below.

H. bocconi (*H. siculus*). This also has much divided pedate leaves strongly toothed, not perennial, the flowers are larger than in *multifidus*, flatter and yellowish-green and distinct in always being the first green species to appear. Later flowers, if any, develop a coppery tinge which may be usual in nature. This is also elder-scented.

H. viridis. Is not according to the botanists our native green hellebore which they say is a subspecies *H. viridis occidentalis*. The leaves are deciduous not as cut as in the two previous species, but as I have seen them in Spain, extremely variable. I should not dare to indicate to you which is *H. viridis* and which subsp. *occidentalis*. All *viridis* forms have a strong odour. The green flowers with their pointed tepals are very similar.

There is a plant in gardens under the name *H. viridis purpureus* in which the green flowers have a distinct suffusion of violet externally. I think it is a hybrid but as it failed to flower this year I have been unable to have it identified.

H. dumetorum. This has the smallest green flowers of any of the species, less than 1 inch across. The leaves are deciduous, pedate and variable, and the stem leaves tend to overlap the flowers which as I remember them form a little cascade. I say this because I no longer have the true plant. It is scentless.

The remarks at the beginning of the green-flowered species do not apply to the very distinct and charming *H. purpurascens*. The leaves are very variable from roughly palmate to as pedate as in *multifidus*. The leaves are deciduous and distinctly pubescent but it is also distinct in the colour of the flowers and the way they develop. They are about 1½ inches across, externally dove or pigeon-breast colour, internally emerald green. The first ones open when the stem is only about 1 inch tall. Others open in succession as the stem lengthens to a final 8 inches or so. Such choice morsels so near the ground are a tempting invitation to slugs, of which they take full advantage.

SCHIFFNER gives the flower size as 3 inches, which may refer to the hybrid *H. purpurascens baumgarteni* (*H. multifidus* × *H. purpurascens*) which I have never seen.

I think it is worth recording the wonderful range of hellebores which the old nurseries maintained. These are taken from the list of the Tooting Nursery of Parker in 1878 and of Barr & Sugden, when at Tooting in 1881, possibly the same nursery. I use what I believe to be the correct names.

H. niger altifolius (*? major*)

H. antiquorum, *abchasicus* and vars., *atrorubens*, *olympicus*, *olympicus pallidus*, *olympicus major*, *guttatus*, *orientalis*, *caucasicus* (? if *orientalis*).

H. viridis, var. *pallidus*, var. *laxus*, *cyclophyllus*, *bocconi*, *dumetorum*, *purpurascens*, *odorus*.

H. intermedius, *graveolens*, '*torquatus*', *lividescens* (*abchasicus* × *purpurascens*).

Although obviously the time of flowering will vary from season to season, it may be of interest to record the order in which they flowered with me in the winter just past.

TABLE II

November: *H. bocconi*.

December: *H. atrorubens*, *orientalis glaber*, *purpurascens*, *olympicus*, *multifidus*, *odorus 1*.

January: *H. odorus 2*, *foetidus*, *viridis* (Jugo-Slavia), *niger* forms, *antiquorum*, *orientalis*, Lenten roses.

February: *H. antiquorum* var., *abchasicus* var., *viridis* (*? occidentalis*), *corsicus*, *lividus* hybrids.

THE HYBRIDS

It is now time to turn to the hybrids and to start with I will deal with the natural ones, of which there are several, including a mystery plant *H.* 'torquatus'.

H. 'torquatus' is by no means a new plant as you will have noticed from the list of the Tooting nursery. It is also mentioned by FARRER in *In a Yorkshire Garden* as a "cherished specimen" and in *Alpine and Bog Plants* where he says: "the bluish 'torquatus' is attractive indeed". Whether it completely died out, I know not, but a stock was reintroduced by MR. WALTER INGWERSEN in 1929, who, almost by accident, found it on Mt. Kopravnik.

The plant is deciduous, with leaves halfway between pedate and palmate. The flowers borne on 6-inch stems have pointed tepals and the colour is difficult to describe. Externally they are a dark bluish-violet with a suspicion of purple, the inside is green with the external colour appearing at the edge.

Now there is no such name in either of the monographs applied either to a species or a hybrid. The first question therefore is, how did it arise? I am fortunate in being able to elucidate this present-day mystery.

In the 1880s, T. H. ARCHER-HIND of Newton Abbot was the greatest collector and breeder of hellebores in this country and this is what he wrote in *The Garden* of 1884, in what he called a horticultural description of hellebores.

" 'Torquatus', except *graveolens*, the smallest of the purples, purple inside and out, remarkable for the manner in which the flower stands at right angles from its short stem and for the white collar round its neck, from which feature I gave the name on finding the plant many years ago in an old garden."* But there is more yet. ARCHER-HIND had a friend BROCKBANK who at that time lived at Teignmouth and in the same year of *The Garden*, he wrote: "T. H. ARCHER-HIND knew of one plant in the Botanic Garden at Cambridge," and he goes on to relate that one autumn ARCHER-HIND found that this plant had been covered and turfed over. What vandalism! This was in the time of one MUDD, the superintendent. However, search was made, the plant found and a piece given to ARCHER-HIND.

This explains the name but not what it is. By the courtesy of the Director I have been able to see the only list extant of plants grown at Cambridge in early days, dated 1850. I quote this because I doubt whether any Botanic Garden at present can produce such a one. The plants were *H. niger*, *odorus*, *purpurascens*, *viridis*, *atrorubens*, *foetidus*, *lividus*, *pallidus* (an *olympicus* form), *intermedius*, *laxus* (a form of *viridis*) and *graveolens*.

I have already mentioned that this plant does not correspond with any species described, and I have found it self-sterile and therefore probably a hybrid. There are two natural hybrids in this Cambridge list, *H. intermedius* (*H. atrorubens* × *H. dumetorum*) and *H. graveolens* (*H. atrorubens* × *odorus*?). (ULBRICH regards both these as species, SCHIFFNER as hybrids. GRAEBNER in his Synopsis states that the combination for *H.* × *intermedius* is correct as the plant is found only

* Torquatus, in Latin, means adorned with a neck chain or collar.

in districts in which both plants grow.) Further, in *The Garden* of 1879, there is a coloured plate of hellebores, and one designated *H. intermedius* is very like our problem plant. Finally, this year I submitted flowers from one of my plants to HERR SCHACHT (of the Munich Botanical Garden) who agreed it as *H.* × *intermedius*. His colleague PROFESSOR MARKGRAF has some doubt but is sure it is not *H.* × *graveolens*. It is possible that stocks vary, as even in the wild it may cross back with one or other of the parents, also it will vary according to the form of *H. atrorubens* concerned. It would be most interesting to study the population in such conditions. In the garden it crosses readily with Lenten roses and some of the progeny are close to the parent.

With regard to the collar, BROCKBANK pointed out that sometimes there was a clear circle of light green round the stalk at the base of the "sepals" and he says *intermedius* resembles it without the ring.

A year later in *The Garden* a correspondent pointed out that the ring is found in several allies of *H. purpurascens*. I have myself seen both a pale green ring and a reddish one on the pedicel of flowers from the same plant sent by a correspondent. My own plant has the former.

It would seem therefore that our mystery plant is *H.* × *intermedius* or one of its clan.

It will have been noted that the Tooting list gives *H. intermedius* and *H.* 'torquatus'. The latter they undoubtedly had from ARCHER-HIND and either they had not compared the plants or as suggested above their *H. intermedius* was not exactly the same.

Apart from *H.* × *graveolens* already mentioned, but not seen, the only other recorded natural hybrid is *H. purpurascens baumgarteni* (*H. multifidus* × *H. purpurascens*).

It would, I suggest, be well worth while repeating these crosses.

Having solved the mystery, we must turn now to the garden hybrids which horticulturally are the most important for garden decoration in the early years.

Following the order of the species, there are the hybrids of *H. corsicus* and *H. lividus*. These cross readily wherever they are grown in proximity but as far as I know, SIR FREDERICK STERN is the only person who has made the controlled cross *H. corsicus* × *H. lividus*. A wise choice as the former is much more vigorous than the latter. This has recently been described and figured in the *Botanical Magazine*, N.S. 291, as *H.* × *sternii*. There may be good reasons for figuring this plant but the F. 2 generation are, to my mind, much more beautiful and interesting. Some are like a much improved *corsicus*, one I measured had *H. corsicus*-like flowers 3 inches across, others are vigorous compact plants 2 feet across with some of the beautiful marbling of *H. lividus* leaves and a distinct infusion of the livid purple.

In others, most handsome, the pale veining of the leaves of *H. corsicus* is much enhanced without any marbling, they appear to be etched in paler green.

I have a plant of *H. corsicus* × *viridis* given me in 1949 by DR. G. TAYLOR. After two moves it is not very vigorous but the fact that it has survived is surprising. This suggests that other hybrids on similar lines might be worth making.

Next we come to *H. niger* concerning which it has frequently been claimed that its blood is present in some of the Lenten roses. I disagreed with a statement to this effect by the late A. T. JOHNSON in *Gardening Illustrated*. He quoted MR. CHITTENDEN as his authority, yet I still disagree and am supported by much greater authorities than myself.

In 1883, the greatest British raiser of these hybrids, T. H. ARCHER-HIND, wrote in *The Garden*: "I have not found *H. niger* cross with other kinds and yet I have had some grown in very close proximity for 40 years." A year or two later a correspondent to the same paper said: "In 1882 I crossed *H. niger*, *H. atrorubens* and *H. olympicus major*. *H. niger* gave no seed." In 1898 ARCHER-HIND wrote again in *The Garden*, "I have never succeeded in obtaining a cross between any *H. niger* with *H. orientalis* (he is referring here to the Lenten roses) on the one hand or *H. viridis* on the other."

If further proof is needed may I quote MR. MOORE (later SIR FREDERICK MOORE), Director of the Glasnevin Botanic Garden, who said at the 1900 Hybridization Conference that he had failed to cross *H. niger* with any other species, when crossed with *H. orientalis* (Lenten roses) the progeny was always *H. niger*.

Finally, may I add my own small contribution. In 1956 I put pollen of *H. niger* on to the following: *H. bocconi*, *atrorubens*, *corsicus*, *purpurascens*, *orientalis glaber*, *antiquorum*, *foetidus*, *olympicus*, and 'torquatus'. In no instance did I obtain a single seed!

But apparently *H. niger* will cross with *H. corsicus*, for in 1931 MR. STOOKE, of Hereford, showed such a cross as *H.* × *nigricors*, which beautiful plant received only a Botanical Certificate. Information about this cross is extremely scanty, important as it is. As far as I can ascertain *H. niger* was the mother, but whether this was a deliberate or a chance cross I have been unable to find out. The original plant at Wisley died some years ago and a rooted cutting I had from this collapsed after the wet summer of 1954. It was a very beautiful plant, with many flowered heads of cream and green flowers and leaves intermediate between the two species. I tried to repeat the cross this year but failed, but I am glad to report that a similar plant has appeared in the garden of a friend among a batch of *H. niger* seedlings. It is evident that deliberate crossing would be worth while.

The earliest hybrids using *H. guttatus*, *abchasicus*, *orientalis* and *olympicus* appear to have been raised at the Berlin Botanic Garden between 1858 and 1880. Many improved hybrids were raised in Germany by MAX LEICHTLIN and in Switzerland by Messrs. Froebel. The old lists of Messrs. Barr contained many names of German origin.

Judging by the plates some very good hybrids were raised in France

but seem to have disappeared except that probably one or two of MISS LINDSAY's originated from that country. I quote from the *Revue Horticole* of 1902 the alleged parentage of some of these, without comment. In this Journal ANDRÉ states that the pollen of a larger and better coloured *H. foetidus* was put on to *H. purpurascens* and that the best of the seedlings were sorted out and then crossed by *H. niger*.

In this country, as already mentioned, the foremost raiser was T. H. ARCHER-HIND, of Newton Abbot, who appears to have had a nearly complete collection of the species and their forms. At first, I believe he made deliberate crosses, with the object of eliminating the two green-tinged tepals, as well as making new varieties. Later, without deliberate crossing he collected seed from his best forms and selected and reselected from these, and undoubtedly achieved his object. The strain I have came from his via A. C. BARTHOLOMEW, of Reading. There is a range from pure white through cream to pink and lilac and on to deep maroon and crimson. Some unspotted, some with large spots on a white or pink ground, others peppered with small dots. Most of them are cup-shaped with overlapping tepals, others show the more pointed tepals of some of the species.

When one knows the species it is fairly easy to guess at the probable parentage. The pure whites are derived from *H. olympicus* and those with a creamy tint from this and *H. orientalis* or one of its progeny, and possibly *H. odorus*. The lilacs seem most likely to have sprung from *H. antiquorum*. *H. guttatus* spots are dominant and any form with these large dots certainly contains its blood. The peppered forms obviously derive from *H. abchasicus*, whether on a white, pink or reddish background. The maroons may either be nearly pure *H. abchasicus* if peppered or contain *H. atrorubens* blood if not (Figs. 83, 84).

There are one or two named hybrids to which it may be of interest to refer in a little more detail.

H. luteus grandiflorus is the yellowest form I know; it is of Irish origin and J. W. BESANT, at one time Curator of Glasnevin Botanic Garden, suggested it may be *H. antiquorum*, presumably the greenish-white form and *H. cyclophyllus*; it has a loose flower with pointed tepals. There was a large plant at Myddelton House which, when in flower, stood out strikingly against a dark background of aucubas.

MR. BESANT also referred to Hellebore Yellow seedling, which he said was yellower still, but this appears to have been lost.

There are two, at least, of ARCHER-HIND's yellows surviving, *H.* 'Primrose Dame' and 'Combe Fishacre yellow'. They look to me like *H. orientalis* seedlings in which a trace of *H. guttatus* is revealed by the spots at the base. They are not very yellow!

The origin of that very rare plant *H.* 'Black Knight' is a mystery. Many years ago it was advertised in Messrs. Barr's catalogue and MR. G. BARR informs me that it was of continental origin. The flowers of the true plant are a black-crimson and the cauline or stem leaves are dark also. The faded flowers develop a violet shade internally. MR. WALTER

INGWERSEN suggested that it has *H.* × 'torquatus' blood, which is not impossible as this hybrid crosses readily with other Lenten roses. By observing it in detail at all stages it might be possible to deduce a possible parentage and this I hope to do as it is well worth reproducing in quantity.

With the many hybrids we have already, one may question whether further improvement is possible or even desirable. I think it is and would remind you how often, after years of neglect, a group of garden forms has been taken in hand again and further improved by crossing and selection.

I will briefly indicate the possibilities as they appear to myself.

Many object to hellebores because they hang their heads and thereby hide their greatest beauties from the casual observer. There appear distinct possibilities that by selection a race with horizontal flowers might be fixed. SIR FREDERICK STERN did some work on these lines. I have also been informed by HERR F. MEYER, of Hamburg, that many dark types originated from MAX LEICHTLIN and that those with horizontal blooms were very beautiful. In this connection it will be recalled that *H. antiquorum*, *odorus* and *orientalis* have nearly horizontal flowers.

Then there is ample scope for the development of better yellows; primrose is, perhaps, a better term. For this I suggest *H. orientalis*, *odorus* and possibly *H. cyclophyllus* crossed both ways as well as using *H.* × *luteus grandiflorus* if you have it. MISS LINDSAY has recently given me a charming lemon yellow *H. odorus* seedling which she suggests is *H. odorus* × *H. orientalis*, but the presence of dots at the base of the flowers indicates the presence of *H. guttatus* also.

There are three possibilities of development by selection from existing strains as shown by seedlings which have appeared with me. Flowers with a waved edge, whites or near whites with a band of colour on the outside of the tepals and lastly the fusing of the large spots of *H. guttatus* hybrids into a complete dark eye.

Then for those who like the curious violet or black purples illustrated by *H.* 'Black Knight' and *H.* × *intermedius*, I suggest using combinations of *H. atrorubens*, *dumetorum*, *multifidus* and *purpurascens*, but be prepared for disappointment.

CULTIVATION

All the species are native to limestone areas, and grow on hillsides often in the shade of deciduous woodland, in stony, well-drained soil. These conditions they all prefer in the garden, but the species are less tolerant of acid soils than the hybrids. *H. niger* is notably capricious and this was noted long ago by CANON ELLACOMBE and many other early writers and I am sure that for this species plenty of lime is essential. Had I not seen a picture of *H. purpurascens* growing in the peat wall at Edinburgh I should have said that a soil on the alkaline side was desirable for all the others and still think it wiser to provide this.

The hybrids are much more tolerant as regards soil reaction and flourish without any difficulty in the natural Porlock soil with a pH of 5·5. None of them like wet winters, but here again the hybrids are more tolerant than the species, but beyond providing good drainage one can do little about it. All like a good loam in preference to a sandy material. *H. vesicarius* is in a class by itself as it dies down in the summer, and must then be kept dry until autumn rains bring it to life again. Whether it can be grown permanently in the open I cannot say. What I can say is that almost all the stock raised from seed introduced by E. K. BALLS has disappeared.

As regards feeding, I find that the ordinary debris of leaves, etc., in a not-over-tidy garden is sufficient nutrient for the hybrids called Lenten roses. As I have already suggested I am sure that heavy dressing of organic manure are detrimental, particularly to Christmas roses. They and the species, in my climate, do sometimes require a little help and if their vigour is not what it should be I have no hesitation in giving them properly balanced inorganic fertilizer preferably in a liquid form.

PROPAGATION

As cross pollination of the most important species occurs very readily, raising from seed is unsatisfactory unless precautions are taken to prevent this. For general purposes increase must be by division and unfortunately hellebores object strongly to this operation. If it has to be done I recommend August when new roots are about to form and that the clumps should be divided into single crowns each with a piece of rhizome and a few roots and potted up singly for the first year, the pots being plunged in the open or in a cold frame. In my experience they should never be divided into big pieces as these take years to recover. The process can also be carried out in the spring using the same procedure, but the divisions require much more attention if the weather is dry. The general run of hybrids except for outstanding forms, are best raised from seed and any of inferior form or colour destroyed. In my opinion it is waste of money to buy named varieties, you get them all in a good strain.

Collecting the seed is an anxious job, for the carpels when ripe, open suddenly and in a remarkably short time spill out the loose seed. I find the best system is to press gently the end of the carpels with the thumb when they change from green to yellowish; if a slight split occurs they are ripe and can be gathered at once and placed in paper bags. In the course of a few days they will open fully and the black seed fall out if the bag is shaken.

When to sow. At one time I thought August, that period of minimum pressure in the garden, soon enough, expecting good germination the following winter or spring. My theory received a shock when 1954 seed so treated did not germinate until 1956!

So last year I tried an experiment with fresh seed of *H. niger*, twelve seeds being sown in a standard mixture and as prepared allowed

to stand in a shady cold frame. They were moved to the open in the winter but still all together. Here are the results:

TABLE III

Sown as ripe (1956)	*Germinated* (1957)		
	Feb. 2	*March* 3	*April* 4
May 25	—	3	5
June 27	2	2	2
July 26	3	4	4
August 25	—	—	—
September 28	—	—	5
October 25	—	—	—

The bulk of seeds was kept on the kitchen mantelpiece to make sure of maturation if such was necessary. I do not claim that this experiment is conclusive, the results may vary from season to season but it does suggest, sow as soon as ripe or within a month or two. Purchased seed certainly will not germinate until the winter or spring after sowing. Whenever sown it is best to plunge the pots out of doors in the shade and remove to a cold frame when germination occurs. I prefer to keep the seedlings until late summer or autumn before pricking out, they then flower the next winter but one if reasonably treated.

DISEASES

I have to close on what may be regarded as an unpleasant note as many have already asked me questions on the subject of diseases. I wish I could say that hellebores never had any but this would not be the truth. I can say that the hybrids are less liable to disease than the species and that those planted out permanently when small are less liable to attack than those moved in later life. The leaves and flower stems may be attacked by one or other of two fungi, particularly in warm, wet winters such as we have just experienced. *H. niger* and varieties are particularly susceptible.

According to the *R.H.S. Dictionary of Gardening*, the two are *Coniothyrium hellebori* and *Phyllosticta helleborella*, the former showing small brown spots and the latter larger black blotches; this in my experience is the most dangerous. As one cannot control the weather the only thing to do should an attack be expected or appear, is to spray the plants and ground at regular intervals with Bordeaux mixture, particularly in the late autumn when the buds are forming in the crowns; correct cultivation being a primary control measure, and removal of dead leaves about May.

To conclude on a pleasanter note, I wish to thank all those who have so generously helped me in building up my collection, in particular MR. ELIOT HODGKIN and HERR SCHACHT for the species and MISS LINDSAY and MR. NORMAN HADDEN for many interesting varieties and other help.

GARDEN DESIGN IN RELATION TO REDUCTION OF LABOUR AND MAINTENANCE COSTS

Brenda Colvin, F.I.L.A., Percy Cane, F.I.L.A., and L. Milner White, F.I.L.A.

(*A Symposium held on April* 16, 1957, MR. R. SUDELL, F.I.L.A., *in the Chair*)

THE CHAIRMAN: We all know how difficult the maintaining of a garden has become, especially the increased cost of all that is required in the form of seeds, plants, shrubs, trees, materials of all kinds, and, above all, the cost of labour. Skilled gardeners in most parts of the country are very difficult to find. Whether the garden is small or large the problem is the same if the greatest enjoyment is to be obtained from the art and science of gardening.

When the Institute of Landscape Architects was invited to provide a lecture on the subject of garden design it was felt that the best way to deal with the problem would be to relate it to the present-day conditions. We therefore invited three members who have practised the art of design in gardens for many years.

Let me therefore introduce our team:

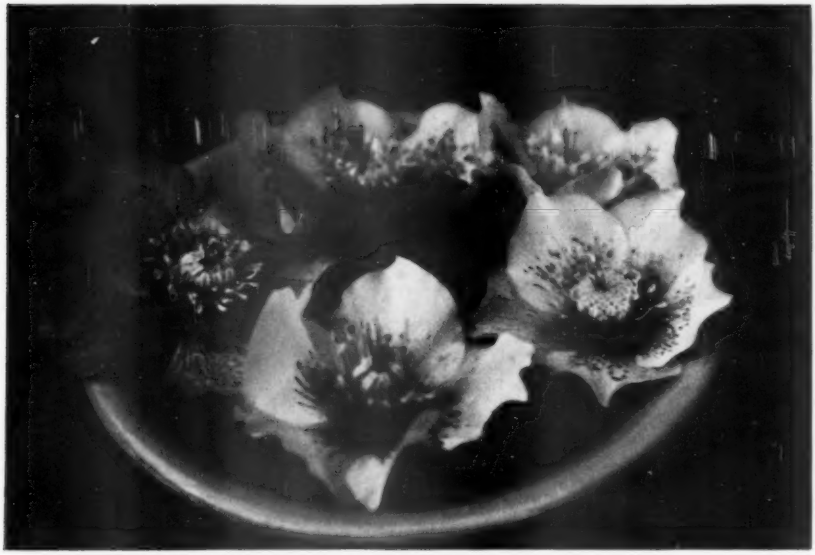
MISS BRENDA COLVIN: I am sure you know from her charming book on " Trees for Town and Country". She has made an intimate study of problems relating to the design of private gardens both large and small.

MR. PERCY CANE will be known to all visitors to Chelsea for his charming gardens, with his signature tune of skilful planting and use of landscape materials—he too has designed many beautiful gardens which no doubt many of you have seen.

MR. MILNER WHITE is the direct successor of one of the oldest firms of landscape architects in the country. He inherits from his father, who was probably known to many of your older members, a flair for landscape design. MR. WHITE himself has a wide knowledge and experience and has designed many gardens both large and small.

Each member of our team is now going to give you his or her views on how a garden could be designed to reduce maintenance costs. After they have given their viewpoints on this problem, we should welcome any questions from members, which the team will try to answer.

MISS BRENDA COLVIN: We scarcely realize, today, that for centuries lawns were mown by scythe, and very well mown too. Up to quite recent times labour was no problem. One knows of estates where a hundred gardeners were employed, at least up to the First World War.



HELLEBORES

FIGS. 83, 84—Two bowls of Lenten roses showing the variation of light and dark colours that can be obtained in these hybrids (See p. 290)

Photo, J. E. Downward

HELLEBORES

FIG. 85—*Helleborus niger* subsp. *macranthus* (See p. 282)

FIG. 85—*Helleborus niger* subsp. *macranthus* (See p. 282)

Photo, T. C. Clare

FIG. 86—Fine form of *Helleborus niger*, often found in gardens under the misapplied name of *altifolius* which is a synonym of the subspecies *macranthus* (See p. 282)

Photo, J. E. Downward

FIG. 87—*Helleborus foetidus* (See p. 281)

Photo, J. E. Downward

FIG. 88—*Pieris formosa* 'Wakehurst' **A.M.** March 19, 1957, shown by SIR HENRY PRICE, BT., Wakehurst Place, Ardingly, Sussex (See p. 309)

Photo, J. E. Downward

FIG. 89—*Dierama pulcherrimum* 'Plover' **A.M.** July 31, 1956, shown by The Slieve Donard Nursery Co. Ltd., Co. Down, N. Ireland (See p. 302)

FIG. 90—Rock garden exhibited by MR. GEORGE WHITELEGG for which a Gold Medal was awarded

Photos, J. E. Downward

FIG. 91—Rock garden exhibited by Messrs. Gavin Jones Ltd., for which a Gold Medal was awarded

FIG. 92—Part of an exhibit of cut flowers shown by the Dutch Flower Growers' Association, for which a Gold Medal was awarded

Photo, J. E. Downward

FIG. 93—Part of an exhibit of ornamental greenhouse plants shown by the Chambre Syndicale des Horticulteurs Belges, for which a Gold Medal was awarded

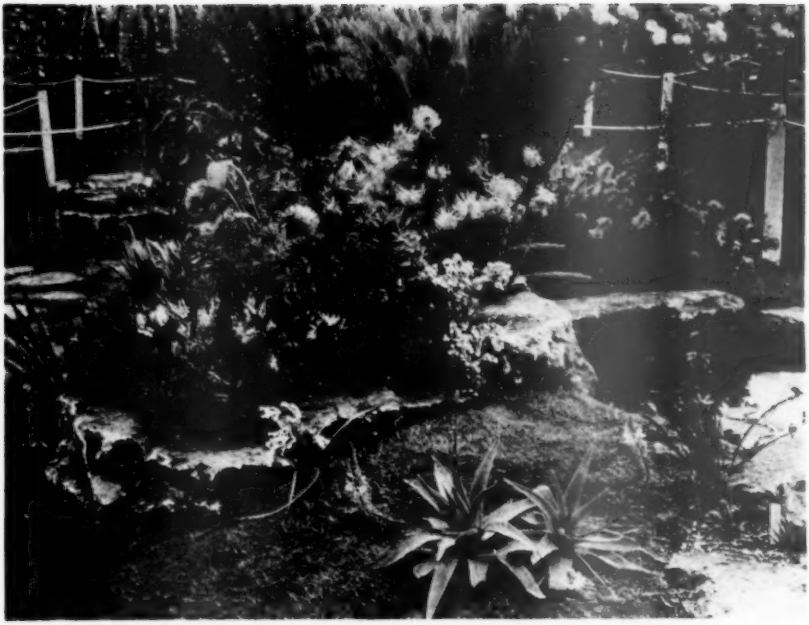


FIG. 94—Part of an exhibit of South African plants shown by the City of Johannesburg Parks and Recreation Department, for which a Silver Gilt Flora Medal was awarded

CHELSEA SHOW, 1957

Photos, J. E. Downward

FIG. 95—Part of an exhibit of aroids and other tropical plants shown by L. MAURICE MASON, ESQ., King's Lynn, Norfolk

Until and including the period between the two wars, it was considered almost axiomatic that good maintenance called for the care of one man per acre. During and after the last war many gardens fell into neglect and ruin as this standard became impossible. A typical example in my own experience is one in which an eight-acre garden was cared for during and after the war by one almost heartbroken man who had been head of eight. He had a motor mower but no other modern aids to gardening.

With the aid of suitable machinery, selective weed-killers, and labour-saving methods of design and planting, however, the upkeep can be done by about a third of the former manpower, even in private gardens. In certain types of parks and playgrounds the acreage per man can be far higher (say ten acres per man?). The standard of maintenance is rather less meticulous—better adapted to present-day planting design, and none the worse for that in my opinion.

In every case, however, the acreage-per-man ratio is of overwhelming importance to the designer, since our efforts come to nothing if aftercare is inadequate. It is essential to plan within the realistic economic facts of each project. For this reason future staffing arrangements must be studied as part of the preliminary fact-finding which sets the stage for any new design.

In the case of small owner-run gardens the same thing remains true. My observation and experience suggest half an acre as the maximum size for an enthusiastic spare-time owner-gardener, while quite a few square yards may satisfy others. The design in either case can be adapted to the special needs of the owner.

It can be argued that with wages and income tax as they stand today, the large garden is becoming an anachronism. But the outlook is not really so gloomy. Apart from the possibility of economic return on part of the ground (to which I shall refer again), technical advances in machinery for mowing, cultivating, clipping and the use of selective weed-killers do cut down labour hours enormously.

In addition there is the new approach to garden design, and especially planting design, and a slightly less meticulous standard of neatness which goes with that new approach—an appreciation of that slight disorder which is rather an engaging characteristic of present-day gardens; I do not think our gardens are any the worse for this new way of planting.

I am a believer in the use of ground-covering plants as aids to gardening. The system is workable over much of the planted areas, and where impracticable, mulching with peat or poplar bark fibre may serve the same purpose. Ground-cover plants which will endure shade from taller shrubs and trees are the gardener's natural allies—things such as epimediums, certain cranes bills and hellebores. In damp soils large-foliaged hostas, rheums and senecios allow little competition from weeds.

Before MR. CANE takes over to discuss this aspect of design, let me

refer, for a moment, once more to the possibility of economic returns. At the outset of any large project, whether private garden or estate, institutional gardens, or other grounds, there is usually the need to determine the most suitable use for each area. In certain projects a land-use plan may be a preliminary necessity, allotting space for ornamental grounds, grazing, playing fields, afforestation, and so on, according to circumstances. The landscape architect may be asked to report on a property before purchase, and in such a report, maintenance in relation to area and use would have to be dealt with.

Most of us are familiar with gardens in which the balance between ornamental and productive areas is adjusted in such a way that labour costs for the whole are covered by produce. This is not the subject of today's discussion—yet we cannot altogether pass it over. It is one of the means by which many a large garden is being saved from destruction—saved for the benefit of landscape generally.

Having reminded ourselves of that, however, let us hear, from MR. CANE, more about the economical design of the non-productive parts of the garden.

MR. PERCY CANE: I think we are all agreed that we must always have gardens, gardens that are our own private property to do with as we like. Each spring we feel nature's reawakening, and from the moment when we see the first tiny spears of the earliest crocus we share the upsurge of life around us. But times have changed and we have to plan our gardens as economically as we may. Cost and scarcity of labour are at the root of most of the troubles, but we live in a machine age, and we must, as MISS COLVIN has so rightly said, make every possible use of machinery.

Economy is a dry subject, and although I would much rather suggest to you, for what my suggestions are worth, ways of spending money freely and having exactly what you would like to have, economy seems to be the order of the day and we must try to combine utility and beauty in the most satisfying way.

However, we are not here to devise ways of spending, but to consider how we can save in the upkeep of gardens, and I would like to suggest several ways in which this can be done. May we take it for granted that any gardens should be kept in good order. There is little pleasure in having an untidy one, and everyone wants to enjoy their garden, not to be a slave to it. First I would say, decide what help you intend to employ and plan your garden accordingly. Lawns present little difficulty. With a 12-inch or 14-inch hand mower for small ones and a motor mower of suitable size for larger ones, they can be kept in order without too much time or labour, and a lawn more than anything else creates a feeling of greater space and throws into higher relief the flowers and foliage of the shrubs in the flanking borders. In glades further from the house the turf need not be mown so closely and could be cut with one of the various machines now available, at intervals of

several weeks, with, if the available help allows, a path from 6 to 8 feet wide mown through the centre of the longer grass.

The old idea of carpet bedding with numbers of bedding plants and annuals in symmetrical rows has given way to the use of flowering trees and shrubs, used in a more natural way, and this form of gardening, as well as saving hours of work, can be infinitely more beautiful and interesting in its results. Let us contrast in imagination a lawn sweeping through groups of rhododendrons, azaleas, cherries, malus, laburnums, cytisus, lilacs, deutzias, berberis and many other shrubs, with a garden with beds of geraniums, calceolarias or any other kinds of plants you like, worrying the surface of the lawns. Flowering trees and shrubs should be planted informally in curving borders or even in long grass and far enough apart for each to show its distinctive habit of growth. From the first delicate greens, springing as it were from some magic so wonderful that it never loses its charm, they are lovely alike in foliage and flowers.

In planning to save labour do not have a rock garden, for nothing in comparison with its size entails so much work. If you wish to grow alpines you could have what I will call, for want of a better term, a Japanese garden. The lawn would run into such a garden; indeed, the garden would be chiefly lawn with a few large pieces of stone carefully placed and with proportionally large groups of your favourite rock plants just where they would tell most.

Herbaceous borders also entail a considerable amount of work; the taller plants must be staked and tied, a job which, properly done, takes a fair amount of time. But many herbaceous plants look much more beautiful in proportionately large groups amongst shrubs than in a mixed flower border, and the alternative is not to have herbaceous borders at all, or at all events to reduce them to the minimum, but to have splashes of colour against a background of green foliage. For effect, I am not speaking of collectors' gardens in which probably one or at the most only a few plants of many varieties would probably be included; a few bold groups of the finest varieties of any particular genus would be far more effective and decidedly less trouble to manage than a lot of small groups of many varieties.

To have more flowering trees and shrubs is really one of the best ways of economizing in the upkeep of gardens. Trees and shrubs give permanent form and without this form any garden must be commonplace. Then there are so many different species and varieties: azaleas, rhododendrons, spiraeas, berberis, etc. To think of berberis, a garden of this genus only would, with their very attractive habit of growth, the tints of their foliage in spring, the yellows of their flower-laden branches and, perhaps best of all, the rich colours of their autumn foliage and ruby-scarlet berries, be lovely all the year round.

Berberis should be planted so closely together that they will grow into masses dense enough to make it impossible for weeds and grass to grow beneath them. To keep them within bounds they should be cut

back once a year with shears. Because of their thorns, a pair of thick leather gloves should be worn when doing this job.

Then there are the old-fashioned and species roses. These do not belong to the rose garden. They are shrubs and should be planted in borders of shrubs, and, another decided advantage, they flower in summer after the greater number of flowering shrubs have finished.

An erica garden on lime-free soil will give carpets of colour and these accommodating plants too only need cutting back with the shears as soon as they have finished flowering. Amongst them hardy lilies which will give colour in summer will add distinction to any garden. Japanese maples, too, in a carpet of hardy ericas would be lovely both for form and colour. Have the red varieties, *Acer palmatum atropurpureum* and *A. palmatum dissectum atropurpureum*. These can be left to grow as they like. Japanese maples do not like wind so they should be planted in some fairly sheltered spot. They will probably die back at the tips during cold winters, but they will repair this damage and ultimately grow into good plants.

PAVING

If cost allows, paved paths in gardens save time in weeding and are always clean. Paving can be laid on cement to prevent weeds growing between the joints, or personally I like it better with enough cement at the intersections of the joints to keep it firm, and this method of laying allows moss and such plants as the low-growing thymes to grow between the stones.

In any garden interest should be heightened at one or more points, and no matter how small, there should be as a contrast to the glades and informal walks a formal garden of some kind. An enclosed paved rose garden, for instance, can be a joy both for appearance and utility. Low-growing plants, thymes, campanulas, should be planted close to the paving to hide the edges, and the purple thyme, especially *Thymus serpyllum atrosanguineus* will be charming with the roses, only it should be kept to the edges and left to grow on to the paving as it likes, but it should not be allowed to grow too much on to the soil under the roses.

Or again, a paved garden, enclosed by hedges or walls, with a fountain figure of lead or stone splashing water into a pool in which water-lily flowers, with perhaps tubs of agapanthus, would give colour enough. In such a garden one or more stone or teak seats or benches could form part of the design. Such a garden would require practically no upkeep and would be distinctive the year round.

Again to save work, kitchen-garden paths could be of stone or concrete without any edgings but only the soil meeting the concrete or paving of the paths.

Time is often wasted in growing surplus fruit and vegetables and the kitchen garden should be only large enough to grow what is actually required. The soil should be rich and it should be intercropped, the

succeeding crop being planted in certain cases before the main crop is gathered. The secret is to have soil rich in humus, which creates warmth, so that the various crops grow quickly and are soon used.

Crocus and snowdrops, scillas and narcissi seem to belong to the more natural parts of the garden and never look so well as when growing in turf. The turf must be left uncut until the foliage of the narcissi has died down, but that does not matter as long as it follows the general lines of that part of the garden in which they are growing. By this means the patches of long grass become an integral part of the design.

Bulbs we must have. Tulips do look well planted in beds or borders on a terrace or near the house, but a large group of some scarlet variety naturalized at the end of a vista will give a brilliant splash of colour unobtainable with cream or yellow narcissi. If given an occasional watering with liquid manure, naturalized tulips will continue to flower well for some years.

And now, having eased my conscience by talking about positive ways of economizing, may I gratify my inclination by turning for a moment or two to the other side. For after all, the reason for having pleasure-gardens is to create a lovely setting for the house. It is in our houses and gardens that we spend the greater part of our lives and together they should make an entity that is completely satisfying to our aesthetic senses. If your garden is small this is easily done, and if it is larger then I would suggest that as a means of economizing you should turn part of it into woodland, in which case it would be easy to create a feeling of greater distance by making the entrance to this wood opposite the principal windows. By doing this, and by the careful choice and placing of trees, it is possible to create an illusion of much greater distance than there actually is. The light foliage of silver birches would be excellent for this purpose. A walk of turf or heather should be made through the trees to return to the lawn at some other point. This walk need not necessarily be mown, but stepping-stones could be laid to provide a dry way through it if desired. On any but calcareous soils rhododendrons or azaleas planted thinly amongst the trees would heighten the interest and beauty of the walk.

From force of circumstances gardens often must be smaller than they were, but may I say in conclusion that the art of making a comparatively small garden appear larger than it actually is lies in having everything, trees, groups of shrubs, separate gardens, proportional to the extent of the garden as a whole. Another point, whereas straight lines and boundaries tend to reduce size, curving borders of trees or shrubs, skilfully managed, can be made to give an illusion of much greater distance than actually exists.

MR. L. MILNER WHITE: I think that we have to look at this problem from two different angles. First, there is the small domestic garden. Here the problem is not so much to do away with all labour—work in the garden is healthy, satisfying and rewarding—but to enable us to have

better results with less output of energy; to do away with the drudgery and back-breaking stooping; to make the work comfortable and pleasant.

People enjoy gardens in different ways: some glory in the physical output involved, others only the passing interest. A garden designer has to study the peculiarities of his clients in this respect. It is a study which has always fascinated me: to discover why people build gardens and their different attitudes to them. The prime motive no doubt is the nest-building instinct which affects us all from time to time. But it comes out in different ways. For the family man with young children, for example, the garden is mainly a playground for the kids. Flowers and flowering shrubs have to take second place.

Then we have the show-offs such as the suburban business man who wants his garden to be a show place to reflect his affluence and as a setting for entertaining his business friends.

Again there is the real horticultural enthusiast. His garden may be a collection of alpines or of some special family of plants. Incidentally, the real plant collector's garden must be the most difficult of all to keep under control. Another enthusiastic horticulturalist is the amateur flower-show competitor whose aim is to grow the largest or the longest or the tallest of whatever takes his fancy and will go to almost any lengths to achieve success. He is a glutton for punishment.

The point of all this is that there is no formula for a labour-saving garden which can satisfy all these diverse needs. What the landscape architect tries to do is to give his client what he wants, but to plan in such a way that the garden is within the capabilities of the client to maintain—with the equipment and the various aids available.

A word about equipment aids: Generally speaking, in the great hand-out of inventions and scientific marvels which has been going on for the last century, horticulture has been, in my opinion, the poor relation. It has got the by-products and the unwanted clothes from the other industries.

For example, take tools and mechanical equipment; if we exclude grass-cutting implements, there is really little offered to the gardener but a collection of scaled-down agricultural and engineering machines. And for general digging and cultivation, unless one wants to garden in straight rows, one still has to use the same hand implements like the spade and hoe which have been basically unaltered for thousands of years.

Science, I believe, has been so fully occupied in other fields that it has not paid the attention to horticulture that it deserves. I believe that invention, will soon be turned to gardening. In a few years' time I hope to see a completely new range of tools for the gardener, lighter and more easily handled than anything we have now, and power-driven of course. Then, for the elimination of weeds, there will surely be light tools which can be used for sterilizing soil *in situ*; others, perhaps, for breaking-up the texture of heavy soils in various ways.

While improvements such as these would add to the profit and pleasure of private gardening, they would be of even more importance

in the second field of our enquiry—that of the larger landscape. In this I would include the parkland, the woodland, the roadside and the industrial landscape.

In this field, design is limited by the practical means and resources for maintenance. We have problems such as how to establish ground cover and other planting on areas too large to be hand weeded; how to deal with steep banks and other areas which for one reason or another are liable to be costly to maintain.

Here again I would appeal to science. We need better plants; not merely new plants with slightly different markings, but plants which will hold their own better, cover the ground better, prove hardier, stand cold winds better and in various ways have those characteristics which we as designers look for in plant material.

May I digress a little and say that it would be a great help if there were also available a supply of plants of greater maturity. One of the serious problems of planting design today is that when the design is put into effect, the size of the plants used is often so microscopic that, not only do they look ridiculous, they have little chance of survival, being hoed out with the first crop of weeds.

Talking of weeds, the selective weedkillers are already a great boon to gardeners and groundsmen and no doubt there will be developments of these. On slightly different lines, I have been wondering whether there would be any possibility of conditioning ground so that it would encourage the growth of one type of plant only, and so making the establishment of ground cover easier. I have in mind what occurs in nature on the heath lands, for instance, where the ground is sour and the ordinary "cultivated" weeds will not thrive. Whether it would be possible to produce such a condition or something similar over a wide area, I do not know, but it would be interesting to try. It would certainly be of benefit if a way could be found to eliminate the "cultivated ground" weeds.

Harking back to the question of design, I think that perhaps the most important contribution I can make to this discussion is the suggestion that maintenance should be a part of the design; or, if you like, that a design for maintenance should be a part of every plan. Whatever development of garden or landscape is projected, it must allow for the necessary maintenance, especially during the early years, to enable the landscaping to be established.

Failure to make this provision is by far the most common cause of failure of landscaping projects. It is, moreover, this limiting factor which more than anything else prevents landscape designers from doing what they would like to do.

THE CHAIRMAN: To summarize the views of the team, I think it can be agreed:

1. That design can be related very definitely to the costs of maintenance.

2. In planting design, the selection and use of the right type of plant material can be labour-saving, appropriate and delightful in appearance.
3. There are numerous machines available for reducing labour.
4. The use of selective weed-killers and chemicals which restrict growth and control pests and diseases, directly or indirectly effects a saving in labour.

From the amateur gardener's point of view, we hope this symposium of the views by landscape architects will enable you to design or redesign your garden so that it can be maintained economically and satisfactorily. We trust it will help you to remove some of the drudgery from your gardening efforts and that you will therefore be able to devote more time to the joy of gardening in its highest forms, whether it be purely for the pleasure of the garden as a place for enjoyment and recreation, or whether it be a place for the cultivation of specimen plants and the finest products of horticulture.

DIERAMA PULCHERRIMUM

Leslie S. Slinger

A SOUTH AFRICAN member of the family Iridaceae, *Dierama pulcherrimum*, is sometimes wrongly named *Sparaxis pulcherrima* (or *pendula*). I have had no opportunity of seeing many of the species which comprise this genus—N. E. BROWN in JOURNAL R.H.S. 54, 194, (1929), refers to twenty-five different species, while I know of two which he apparently does not include in this number. I come to the conclusion that *Dierama pulcherrimum*, if not the finest of the genus, is most certainly the type best equipped to succeed in these islands. Incidentally those who wrongly refer to the plant as *Dierama pulcherrima* should realize that the generic name *Dierama* is neuter.

My father secured his first corms of this lovely plant some thirty-five years ago and the plant was so obviously at home that very quickly large quantities of seedlings were flowering. One or two breaks in colour were observed and work commenced in hybridizing and selection from generation after generation of seedling. From those early pink and purple flowered varieties a range of fine plants have been produced. The original species has now been entirely swallowed up and has broken up to such an extent that seed from any particular form behaves as one might expect from a hybrid—all manner of colours and forms appear in the seedlings.

During these years many fine forms have been selected and named. The following were good enough to obtain Awards of Merit:'Album', a good white; 'Heron', large dark purple; 'Kingfisher', large bells, pale fuchsine pink; 'Raven', deep purple, open bells; 'Plover', funnel-shaped

flowers, lilac pink (Fig. 89); 'Skylark', deep reddish purple; 'Windhover', deep lilac rose.

Others worthy of mention are: 'Curlew', reddish purple; 'Merlin', rhodamine purple; 'Nightingale', pale fuchsine pink; 'Redwing', deep velvety purple; 'Ringdove', pale pink; 'Snowgoose', palest fuchsine pink, 'Starling', cyclamen purple.

D. pulcherrimum normally attains 5 to 6 feet in height though some much larger flower stems have been seen. The variety 'Windhover' is exceptional and spikes up to 9 feet have been measured. The gladiolilike corm when established produces evergreen foliage from which emerge the stiff wire-like stems each bearing six to nine flower spikes, and average five flowers to the spike. The stem droops a little under the burden of flowers, giving that delightful pendulous habit. It is fair to say that such is the strength of the stem that I have never seen one broken by wind. A field of dieramas waving in the breeze is an inspiring sight.

Just before 1939 a kind friend in South Africa sent me seeds of two species of dierama which she had collected. These I have never been able to identify but they proved distinct and valuable. One was a dwarf not more than 18 inches high with flowers coloured an unusual shade of old rose. The other was pale yellow! When these produced their first flowers their value for hybridizing in association with *D. pulcherrimum* was appreciated and the results of this work have been gratifying. The crosses with the dwarf species have yielded a new race of dieramas which attain about 3 feet in height and have a vigour and constitution that is in advance of the old dieramas. They also possess a wide range of colours. Departing from the rather apt bird names used for forms of *D. pulcherrimum* I have given these new hybrids the names of Shakespeare's sprites and fairies. The best of these are: 'Ariel', palest fuchsia purple; 'Iris', medium bishop's violet; 'Miranda', fuchsine pink; 'Oberon', paeony-purple; 'Titania', soft neyron-rose.

The pale yellow flower species unfortunately proved difficult to cultivate and has been lost. A little of its blood was transported to one or two seedlings, but only time will tell if I can retain it.

It is a fair question to ask why these lovely plants are not seen more often if they grow with such freedom with me. I am sure the answer lies in appreciation of cultivation. Though dieramas grow in dry arid regions of South Africa they will require something better than this. It must be mentioned, however, that self-sown seedlings appear and thrive in dry, almost soilless places and do remarkably well, but this peculiarity is not confined to dieramas.

The two vital factors in cultivating dieramas appear to be rich moisture-retaining soil, good drainage and comparative freedom from frost. The soil condition appears to be reasonably easy to come by and I think frost can be kept away by using bracken or a similar substance as a winter top dressing. This, however, is not all. Too many people fail with them by not realizing the dieramas are evergreen. When

transplanted they lose their foliage and are slow to re-establish. After spring transplanting the leaves slowly die away and every indication suggests the plants are dead; if they are left undisturbed and protected in winter, life returns with the appearance of new foliage. After twelve months, progress is rapid, and flower can reasonably be expected during the second summer. It is clear that many people fail by assuming the plants are dead during this first year. Remember that every move means a year in which to recover.

The division of flowering-sized corms assures flower during the second year and rapid progress thereon. Propagation by seed is easy, but four to five years must elapse before the seedlings flower. Again it must be remembered that each transplanting of the seedlings delays maturity and flower.

NOTE FROM A FELLOW

Judas Trees from Seed

THE late LORD ABERCONWAY made note of a particularly good form of Judas tree at Bodnant which never set fertile seed and could only be propagated by grafting onto seedling stocks (R.H.S. JOURNAL, 77, 245 (1952)).

Years ago, when fellows could choose young trees or plants annually instead of seeds, I received a seedling Judas tree which was about a year old. This I potted up and grew in a greenhouse where it made rapid growth. It was planted in the shrub garden the following summer and is now about 30 feet tall. Each year it is laden with arresting pink flowers. In the autumn the long brown seed pods are most attractive. For several years the seeds failed to germinate until I suddenly wondered why the seeds remained intact on the tree well into late spring. I then gathered seed in early summer and sowed a large box of these in the greenhouse—germination was one hundred per cent. I now sow the seeds sometime during April immediately they are gathered and am sure of success.

This beautiful tree is so generous with its seeds that it seems a pity more are not grown. Judas trees will set seed quite well in some areas, particularly in the drier parts of the country. It is possible that the rainfall at Bodnant may be too high.

MRS. B. DEIGHTON

Roughwood,
Effingham,
Surrey.

PLANTS AND PROBLEMS—XXXV

WHITEFLY PARASITE

Question. I should be grateful if you would send me a supply of Whitefly Parasite. I had some from Wisley some years ago and found them a very good control of the Greenhouse Whitefly.

Answer. The use of the Whitefly Parasite, ***Encarsia formosa***, is one of the best and least laborious methods of checking infestations of the Greenhouse Whitefly, ***Trialeurodes vaporariorium***. Unfortunately, however, due to the increasing pressure of other duties at Wisley, we have been forced to discontinue the breeding of this beneficial insect and cannot, therefore, send you any specimens.

The Glasshouse Crops Research Institute, which also formerly supplied the parasite, have discontinued breeding them for the time being and it will be some time before they are in a position to resume this service. Until then we suggest that you use chemical means of control.

Insecticides which are effective against Whitefly include D.D.T., Lindane and Malathion. The treatment may be given in the form of a spray, in which case care should be taken to ensure that it is applied to the lower as well as the upper surfaces of the leaves. Fumigation is less laborious and good control may be achieved by the use of smoke generators which incorporate both D.D.T. and Lindane. Malathion is obtainable as an aerosol, which is also very easy to use.

It must be borne in mind that these insecticides kill only the adult whiteflies and new generations of adults will develop from larvae and eggs which were not affected by the treatment. To deal with these the treatment should be repeated two to three times at fourteen-day intervals, otherwise complete control will not be achieved.

Note to Fellows

The Entomologist would be grateful if, when writing for advice, Fellows would send specimens of their damaged plants and, if possible, specimens of the suspected pest. It is usually impossible to determine the exact nature of the trouble from a written description alone. Easily crushed specimens should be sent in a small box.

WISLEY TRIALS 1957

FREESIAS

Twenty-nine stocks of freesias were received in 1956 for trial at Wisley. The corms were planted, six to an 8-inch pot, on September 27, 1956. The compost was based on the John Innes No. 1 potting compost. The pots were then plunged in peat in a cold frame until the first week of November when they were brought into a cool glasshouse.

The trial was inspected by a sub-committee of the Floral Committee A on February 4 and 12, 1957, and on its recommendation the Council of the Royal Horticultural Society has made the following awards to freesias after trial at Wisley.

The number in brackets after the description of the variety was that under which it was grown in the trial.

ROYAL PRESENT. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd., Bourne Road, Spalding, Lincs.) **F.C.C.** February 12, 1957. Plant 25 inches tall, vigorous; flower spikes 9 inches long, up to ten flowers per spike with five to six open at one time; flowers $2\frac{1}{16}$ inches diameter, $2\frac{1}{2}$ inches long, Sea Lavender Violet (H.C.C. 637/1) margined Sea Lavender Violet (H.C.C. 637), throat white with yellow blotch on lower petal; scent fairly strong. [29]

CARNIVAL. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **A.M.** February 12, 1957. Plant 30 inches tall, vigorous; flower spikes 9 inches long, up to ten flowers per spike with five open at one time; flowers 2 inches diameter, 2 inches long, a bright orange-scarlet near Mandarin Red (H.C.C. 17), throat Indian Yellow (H.C.C. 6/1); scent faint. [23]

CARRARA. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **A.M.** February 4, 1957. Plant 31 inches tall, vigorous; flower spikes 11 inches long, up to nine flowers per spike with six open at one time; flowers $2\frac{3}{16}$ inches diameter, $2\frac{1}{8}$ inches long, ivory white tinged with cream in the young stages, throat yellow at base with blotch on lower petal of Cadmium Orange (H.C.C. 8/1); scent faint. [7]

EL DORADO. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **A.M.** February 12, 1957. Plant 30 inches tall, vigorous; flower spikes 15 inches long, up to eight flowers per spike with four open at one time; flowers 2 inches diameter, 2 inches long, Buttercup Yellow (H.C.C. 5/1) heavily shaded round edges of petals with Cadmium Orange (H.C.C. 8/1); scent strong. [12]

FESTIVAL. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **A.M.** February 12, 1957. Plant 26 inches tall, vigorous; flower spikes 11 inches long, seven flowers per spike with three to four open at one time; flowers $1\frac{1}{2}$ inches diameter, $1\frac{1}{8}$ inches long, Cherry (H.C.C. 722), throat Indian Yellow (H.C.C. 6), scent strong. [24]

ORANGE FAVOURITE. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **A.M.** February 4, 1957. Plant 30 inches tall, vigorous; flower spikes $10\frac{1}{2}$ inches long, eight flowers per spike with four open at one time; flowers 2 inches diameter, $2\frac{1}{4}$ inches long, Buttercup Yellow (H.C.C. 5) marked round edges of petals with Tangerine Orange (H.C.C. 9); scent faint. [14]

WHITE SWAN. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **A.M.** February 12, 1957. Plant 28 inches tall, vigorous; flower spikes 15 inches long, ten flowers per spike with five open at one time; flowers $2\frac{3}{4}$ inches diameter, 2 inches long, white, throat at extreme base yellow with pale mauve striations on lower petals; scent fairly strong. [3]

BALLERINA. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **H.C.** February 4, 1957. Plant 30 inches tall, vigorous; flower spikes 11 inches long, ten flowers per spike with five open at one time; flowers $1\frac{3}{8}$ inches diameter, 2 inches long, ivory white, throat at extreme base yellow; scent faint. [4]

BRONZE GLORY. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **H.C.** February 4, 1957. Plant $30\frac{1}{2}$ inches tall, vigorous; flower spikes 11 inches long, eight flowers per spike with five open at one time; flowers $2\frac{3}{16}$ inches diameter, $2\frac{3}{8}$ inches long, ground colour Lemon Yellow (H.C.C. 4/2) with edges of petals marked brown at tips and Tangerine Orange (H.C.C. 9) along the sides; scent faint. [18]

CAROLA. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **H.C.** February 4, 1957. Plant 30 inches tall, vigorous; flower spikes $12\frac{1}{2}$ inches long, nine flowers per spike with five open at one time; flowers $2\frac{1}{2}$ inches diameter, $2\frac{7}{16}$ inches long, ground colour pale creamy white flushed at margins with both smoky grey mauve and Saffron Yellow (H.C.C. 7), throat pale creamy white; scent faint. [16]

GLORIA SOLIS. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **H.C.** February 4, 1957. Plant 25 inches tall, vigorous; flower spikes 10 inches long, nine flowers per spike with six open at one time; flowers $1\frac{7}{16}$ inches diameter, 2 inches long, Indian Yellow (H.C.C. 6/1) marked round the edge of the petals Tangerine Orange (H.C.C. 9); scent faint, an early flowering variety. [11]

METEOR. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **H.C.** February 12, 1957. Plant 27 inches tall, vigorous; flower spikes 12 inches long, seven flowers per spike with five open at one time; flowers $1\frac{3}{8}$ inches diameter, 2 inches long, Magenta (H.C.C. 27), throat white flushed at extreme base yellow; scent faint. [21]

PAUL RUBENS. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **H.C.** February 4, 1957. Plant 30 inches tall, vigorous; flower spikes $11\frac{1}{2}$ inches long, seven flowers per spike with four open at one time; flowers $2\frac{7}{16}$ inches diameter, $2\frac{3}{8}$ inches long, Geranium Lake (H.C.C. 20/1), throat deep yellow; scent faint. [22]

PRINCESS MARYKE. (Raised by Mr. A. van den Berg, introduced and sent by Messrs. Wulinghoff's Bloembollenbedrijk Ltd., Kleiweg 169, Ryswyk Z.h., Holland.) **H.C.** February 12, 1957. Plant 28 inches tall, vigorous; flower spikes 10 inches long, ten flowers per spike with five open at one time; flower $1\frac{7}{16}$ inches diameter, $1\frac{9}{16}$ inches long, ground colour Lemon Yellow (H.C.C. 4/1) flushed along outer quarter of petal with Poppy Red (H.C.C. 16/1); scent strong. [17]

RHAPSODY. (Raised by Mr. J. A. M. Goemans, introduced and sent by Messrs. Parigo Horticultural Co. Ltd.) **H.C.** February 4, 1957. Plant 29 inches tall, vigorous; flower spikes 7 inches long, eight to nine flowers per spike with six open at one time; flower 2 inches diameter, $2\frac{3}{8}$ inches long,

Magenta Rose (H.C.C. 027/1), throat ivory white with blotch on lower petals of Lemon Yellow (H.C.C. 4); scent faint. [28]

SPROUTING BROCCOLI

Twenty-one stocks of sprouting broccoli were received for trial in 1955. The trial was divided into two sections (A and B): A consisted of ten stocks of the green sprouting broccoli (Calabrese); B consisted of eleven stocks of white and purple sprouting broccoli. Section A was sown on April 4, 1955, and was planted out on June 7, 1955. However, from this sowing date it was found that the plants matured unevenly and the trial was repeated in 1956, when it was sown on April 26 and planted out, 2½ feet square, on June 6. From this later sowing a satisfactory crop was produced and the trial was inspected by a sub-committee of the Fruit and Vegetable Committee on August 30, 1956, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to broccoli.

Section B was sown in 1955 on April 27 and planted out on June 29. However, the winter of 1955–6 caused considerable damage to the plants and so it was not possible to judge the trial. In 1956 the trial was sown on April 26 and planted out on June 20. The trial was inspected by a sub-committee of the Fruit and Vegetable Committee on March 1, 1957, but no awards were made as no stock was considered to be a sufficient advance on existing varieties.

Green sprouting

CALABRESE GREEN SPROUTING. (Sent by Messrs. Watkins & Simpson Ltd., 26–29 Drury Lane, London, W.C.2.) **C.** August 30, 1956. Plant 22 inches high, 26 inches spread; leaves large, erect, oblong, cut, medium grey-green; head 9 inches diameter, close and firm, side stalks up to 5½ inches long, 3 inches diameter, greyish-green; matured second week in August. [1]

CALABRESE ITALIAN GREEN SPROUTING. (Introduced by Messrs. Koning & Vlieger, Goes, Holland and sent by Messrs. J. L. Clucas Ltd., Ormskirk, Lancashire.) **C.** August 30, 1956. Plant 20 inches high, 24 inches spread; leaves large, erect, oblong, cut, medium grey-green; head 6 inches diameter, close and firm, side stalks up to 10 inches long, 4 inches diameter, medium greyish-green; matured second week in August. [3]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1957

Chaenomeles speciosa 'Moerloesii' A.M. April 2, 1957. This distinctive and very beautiful "Japonica" is also known as Chaenomeles 'Apple Blossom'. The flowers are 1¼ inches across, and vary in colour from deep pink (H.C.C. Empire Rose 621/1), through to the palest pink and white. They are clustered heavily along the slender, somewhat spiny branches. The obovate, stipulate leaves are toothed and a handsome dark green in colour. The award on this occasion was given for the flowers, but this plant is also very pleasing during the autumn months

by reason of its attractive yellow fruits. Shown by Messrs. The Sunningdale Nurseries Ltd., Windlesham, Surrey.

Pieris formosa 'Wakehurst' A.M. March 19, 1957. This *Pieris* was raised from seed collected by the late George Forrest on the Schweli–Salwin divide in 1912, under the number F8945. It differs from the type in that the leaves are relatively short and broad. Somewhat clustered at the ends of the shoots, the dark green leaves are elliptic-oblong, acuminate, finely serrulate, glabrous, from 2 to 4 inches long, and ¾ inch wide. The deep red colour of the young foliage sets off the pure glistening white of the flowers most handsomely. The flowers are carried in terminal spreading panicles, 5 inches long and broad, and are urn-shaped, bluntly lobed and ¼ inch across. Shown by Sir Henry Price, Bt., Wakehurst Place, Ardingly, Sussex (Fig. 88).

Regal Pelargonium 'Carisbrooke' F.C.C. April 16, 1957, as a greenhouse flowering plant. It received an award of merit on July 17, 1952, after trial at Wisley, and was described in the R.H.S. JOURNAL, 78, p. 70. Exhibited by the Valence School (gr. Mr. T. W. Walker), Westerham, Kent.

Trillium grandiflorum A.M. April 16, 1957. The stems of *Trillium grandiflorum* are solitary, from 12 to 18 inches high, and have short scarious sheaths at the base. The three-whorled rhombic-ovate leaves are deeply nerved, sessile, narrowed abruptly to the apex, and from 2–5 inches long and wide. Carried on a peduncle some 3½ inches long, the flowers are erect or slightly drooping. The three outer segments of the perianth are slender and green, 1½ inches long. The three inner segments are erect in the lower part, then spread outward, and are white, 2½ inches long and 2¼ inches wide. This interesting and beautiful plant is a native of Eastern North America. It is best grown in an open woodland position in a deep, moist, peaty soil, but may also be grown in the border. Exhibited by the Crown Estate Commissioners, The Great Park, Windsor.

Viburnum (burkwoodii × carlesii) 'Fulbrook' A.M. April 2, 1957. This exceptionally fine Viburnum was raised by the late Miss Florence Paget. The leaves are light green, obovate, scarcely toothed, and on the cut branches shown were 2 inches in length and 1½ inches wide. The strongly scented flowers are carried in thickly clustered umbels, some 3½ inches across. The individual flowers, flushed pink (H.C.C. Rose Pink 427), in the bud, open to pure white. Each flower is ⅝ inch across, with rounded lobes, and is carried on a pedicel which is green with a reddish tinge, and about 1¾ inches long. Shown by Mrs. Douglas Gordon, Fulbrook House, Elstead, Surrey.

ORCHID

× Potinara (Marga g.) 'Ghana' A.M. April 2, 1957. This cultivar has the elements of four genera in its constitution; the name × *Potinara* being used to designate this multigeneric group. Three flowers were borne on the plant exhibited and each flower was about 5½ inches by

5½ inches. The flower is completely orange, mainly of a light shade, but the throat of the labellum is deep orange. The outer tepals are narrow oblong with recurved apices. The broad inner laterals have undulating margins and a central groove down the segments. The labellum is strongly bifid and encloses the column in its lower portion. The margin is strongly scalloped. The parents are *Laeliocattleya* 'Golden Blossom' and × *Potinara* 'Dorothy'. Exhibited by H. W. B. Schroder, Esq., Dell Park, Englefield Green, Surrey.

BOOK NOTES

"Return to the Irrawaddy." By F. Kingdon-Ward. Royal 8vo. 224 pp. Illus. (Melrose.) 25*s*.

To every plant lover, be he professional botanist, horticulturist or plant ecologist, a new book by Kingdon-Ward is an event. He will expect charming, vivid, descriptive writing, authoritative comment upon the vegetation, and much entertainment of a lighter nature besides, and in *Return to the Irrawaddy* he will not be disappointed.

This book tells us about a journey the author, and his no less enthusiastic wife, made to the Triangle in North Burma in 1953. To the reviewer it brings back, with more than a suspicion of nostalgia, a journey twenty years ago with the author in similar country thirty or forty miles to the west of the Triangle. We saw mostly the same trees and shrubs—but no strange lily like the epiphytic *Lilium arboricola*, which was the main discovery of the Kingdon-Wards, was there to intrigue us. Kingdon-Ward has much to tell us about the bird and animal (including human) life of this area, the plants both large and small, and about his efforts to bring back seeds of the more desirable plants to add to the many he was the first to introduce into our gardens. All this is skilfully welded into a book which makes delightful reading. The illustrations are superb, though the one facing page 193 is really a libel on Jean Kingdon-Ward. This is a grand book and we advise everyone to read it and possess it.

N. L. BOR

"The Winter Garden." By M. J. Jefferson-Brown. Med. 8vo. 156 pp. Illus. (Faber and Faber.) 18*s*.

The case for growing winter-flowering plants is a strong one and at that season flowers are much appreciated that in the height of summer would hardly be noticed. So many winter-flowering plants also have an added attraction in possessing a strong scent.

Mr. Jefferson-Brown surveys the flowers available with discrimination as well as suitable enthusiasm and has produced a book that can be confidently recommended to all gardeners.

He starts with a useful chapter on Planning the Winter Garden, using the term winter to cover the four months of November to February inclusive and, variable as our seasons are, he does not seem to have exaggerated in any way the range of material available. In fact some additions could well have been made such as that lovely willow *Salix aegyptiaca*, formerly known as *S. medemii*, which this year came into flower early in January. His chapter on Bulbs and Corms is excellent, only Galanthus 'Merlin' need no longer be described as new, having been raised over fifty years ago. This is followed by sections on various plants such as hellebores and his advocacy for growing more of these from seed, particularly the forms of *Helleborus orientalis*, can be strongly affirmed by all those who have done so.

Perhaps the most interesting chapter in the book is that dealing with qualities of leaf and bark that can be so well appreciated in winter. The sections on varieties of hollies and of ivies should certainly be studied and should suggest greater adventurousness in the use of these two genera. His suggestions also for using fruit hormone sprays to retain the berries on shrubs and the fruit on various crab-apples is an interesting one and an experiment that seems well worth trying.

The illustrations are for the most part very good and show well the plants selected. The colour of the frontispiece of *Iris unguicularis*, however, is one which that flower has never yet attained, but the fault is probably due to overlighting.

PATRICK M. SYNGE

"Gardener to Queen Anne. Henry Wise (1653–1738) and the Formal Garden." By David Green. Roy. 8vo. xx + 232 pp. Illus. (Oxford University Press, 1956.) 70*s*.

To most students of the history of gardening the name of Henry Wise, if it is known at all, may suggest a rather shadowy figure, associated with the possibly better known George London, and with London, open to considerable criticism as an author of grandiose designs suited to the taste of an age in which people, as Horace Walpole put it, seemed to relish "going up and down stairs in the open air".

Indeed, W. Carew Hazlitt, though mentioning London and Wise "with appreciative respect", castigates the falsity of their gardening principles, and their "preposterous plan of deforming nature by making her statuesque, and reducing her irregular and luxuriant lines to a dead and prosaic level through the medium of the shears".

Mr. Green's scholarly book, however, has done much to give the reader a more balanced view of Wise's methods and achievements: despite the kind of criticism instanced above, he was an important figure in the history of English horticulture, and the present monograph is a worthy tribute to his memory.

This detailed, well documented study of the history of the formal garden may perhaps be a little hard going for the general reader—its format should discourage superficial reading—but it will be invaluable to those seeking information on the horticultural and social history of the late seventeenth and early eighteenth centuries.

It is rather less a study of the life and work of Wise than a picture of an episode in history in which the principal rôles were played by Sir John Vanbrugh, his collaborator Nicholas Hawksmoor, and the formidable Duchess of Marlborough. None the less, Wise emerges from the story as a man of dignity and character, with a mind open to other ideas than those solely in the traditions of André Le Nôtre.

The first two sections of the book take us from the days of the London and Wise enterprise at Brompton Park down to the end of the reign of Queen Anne, while the third treats of Wise's activities during the following reign up to the time of his retirement to Warwick—a retirement that must have been all the more welcome after the uproar caused at the Board of Works by the machinations of the egregious William Benson. The fourth section includes a chapter on "The Literary Gardener", and another on "Wise and Garden Design". There are seven appendices (one of them is a catalogue of books belonging to Wise, among which were Euclid's *Elements* and Barrow's *Discourses on our Latter End*), a bibliography, and an index. The well got-up and finely printed book also contains fifty-three plates, some of which reproduce plans of the gardens and parks at Hampton Court, Kensington, Windsor and Blenheim which greatly help in elucidating the text.

There are many interesting topics in Mr. Green's volume, but if one alone may be cited, the references to Stephen Switzer well repay study. Switzer (d. 1745), who was employed at one time by London and Wise, was also a horticultural writer of whom Mr. Green remarks that one cannot have too much. It was Switzer, in his *Ichnographia Rustica*, Vol. I, 1742, p. 80, who wrote: "Mr. London and Mr. Wise being Joint-Partners, and thus, as it were, both possess'd of the Royal Favour, and the Purses of the King, Queen, and Nobility, left no stone unturn'd to carry on their designs." What those designs were, will be discovered in the pages of Mr. Green's book, but the famous partnership could not have been better described.

A. C. TOWNSEND

"Pictorial Plant Propagation." By G. F. Gardiner. 152 pp. Illus. C. Arthur Pearson, Ltd. 18*s*. 0*d*.

The five main chapters into which this book is divided have orthodox main headings, namely: Propagation by Cuttings; Layering; Grafting and Budding; Raising Plants from Seeds, and Miscellaneous Methods. Each heading is then subdivided into numerous specialized subsections, but it is soon made clear that the author had attempted far too much within the scope outlined. The result is that instead of succeeding in giving the instructions he sets out to do he is inclined to leave the reader with incomplete accounts of some of the methods he mentions.

There are 102 photographs, 68 of which portray various aspects of plant propagation and most of these can be studied by beginners with advantage; the remaining 34 are of plants which are mainly typical of those raised by the methods described.

Experienced propagators will certainly not agree with inserting shrub cuttings 15 inches long as mentioned on p. 24, neither will they accept in full the lists of shrubs as they appear on pp. 26, 28 and 60. The term "whip or tongue" as a method of grafting mentioned on pp. 69 and 72 should surely read whip *and* tongue.

F. P. KNIGHT

"British Trees, A Guide for Everyman." By Miles Hadfield. 468 pp. Illus. (London: Dent.) 30*s*.

The title, *British Trees*, of this interesting volume needs some qualification. The book deals with the relatively few species of trees that are native to the British Isles and with a good selection of those in cultivation here, including those most widely grown in parks, gardens, and plantations.

There is a short introduction dealing with such matters as classification, arrangement, determination, and nomenclature. The main body of the book consists of descriptions and comments, in great variety and often most instructive, with black-and-white text figures of gymnospermous and angiospermous trees. The gymnosperms (*Ginkgoales* and *Coniferales*) occupy nearly one-third of the volume. The angiosperms are all dicotyledons. The descriptions are clear, adequate, and concise and are accompanied by accounts of the best-known varieties, geographical ranges, ecology, cultivation, diseases and pests, characteristics and value of timber, and other details some of which are of a kind not found in many books dealing with trees. In several genera, such as *Populus*, *Ulmus*, and *Sorbus*, a number of the micro-species are dealt with, either fairly fully or in paragraphs under major species. The true botanical status of many of these micro-species (if such they be considered) is not yet settled and hybridization probably played a part in the history of many of them. Apart from these taxonomically difficult groups, it may be suggested that an intensive study of variation of several of our native trees might yield scientifically interesting and economically valuable information. The common ash and the beech are particularly recommended as objects for statistical studies in variation of both vegetative and reproductive organs.

The text figures are for the most part excellent. They show the main characters for determining the species and are pleasing as good examples of botanical drawing. Something seems to be wrong with the caption or drawing, or both, of Fig. 123 *d*. One would not expect sepals to arise from the top of a leaf stalk.

It is felt that this book can be thoroughly recommended to all who wish to obtain accurate knowledge of nearly all the tree species growing in this country, apart from such rarities as are limited to botanic and a few other special gardens.

W. B. TURRILL

"Herbaceous Garden Flora." By F. K. Makins. 374 pp. Illus. (London: Dent.) 35*s*.

This book should prove of interest and use to a wide range of garden lovers. Its subtitle describes it as "A guide to the identification of more than 1,000 species of herbaceous perennials, biennials, and annuals cultivated in British gardens for ornament, with 224 pages of line drawings". It has three main parts: keys to the families and genera, pages of black-and-white figures, and brief descriptions of the species drawn (with some extra ones). The keys are, on the whole, well constructed and their use should make the horticultural botanist familiar with the distinguishing technical characters for the families and genera of most of the plants cultivated in flower gardens, shrubberies, and arboreta in Britain. It is unfortunate that -celled and not -locular is used in such phrases as "ovary 2-celled", and cell in place of loculus in, for example, "one seed in each cell". The term cell should, in botany, be retained for and limited to the microscopic unit of structure.

The figures are mostly four to six to a page and are so printed that they can be shaded or coloured if desired. They have not been drawn to a definite and uniform scale and magnifications are not given. It is true that in the descriptive part flower or inflorescence sizes are given, though it appears that these are sometimes of length and sometimes of diameter, without it being stated which is meant. Most of the figures are both accurate and, within their limits, pleasing, but some are below the general level, as, for example, those of *Anemone coronaria*, *Hesperis matronalis*, and *Jasione montana*.

There are a number of photographs, of garden scenes and plants, reproduced as plates.

The brief descriptions are given under scientific names, most of which are accented to indicate the usual emphasis of syllables. The approximate height in feet, the period of flowering in months, and the duration are followed by such details as flower size and colour, some particulars regarding inflorescences and bracts, notes on leaves, and so on. The country of origin and, when known, the date of introduction are given at the end of the descriptive paragraphs.

One regrets that the author did not live to see the book published.

W. B. TURRILL

"Diseases of Garden Plants." By A. Beaumont, M.A. Illus. (W. H. & L. Collingridge Ltd., London.) 25*s*. net.

Although we cannot agree with the publishers' statement that no book dealing with diseases of ornamental plants has appeared for fifty years we would agree that during that time no publication has dealt with such a large number of them. We would further say that for gardeners the subject has never been presented in such an understandable manner. Mr. Beaumont has a wide experience of plant troubles and understands the difficulties met with by gardeners and small growers in trying to recognize and defeat the various diseases which may attack and destroy their plants. In this book of eleven chapters he devotes the first chapter to a classification of symptoms in the broadest sense and the second chapter to a general discussion on various methods of control in common use. From Chapter III onwards we are provided in turn with descriptions of the diseases found on various crops, such as potatoes and other vegetables, annual and perennial flowers, bulbs and corms, trees and shrubs, lawns, as well as on fruits of all kinds. Each disease is described and methods of control briefly given. The text is interspersed with no less than sixty-three photographs and sixteen line drawings and there is a good index. The photographs are, on the whole, good.

We doubt whether gardeners are interested sufficiently in plant diseases to pay 25*s*. for this kind of book, but we believe it to be the best reference book they can obtain on this subject. It presents the latest methods of combating various plant diseases in a most straightforward and practical manner and it is unlikely that within its pages even the most exacting gardener will fail to find useful information for keeping his favourite plants healthy.

D. E. GREEN

"Modern Coffee Production." By A. E. Haarer. Royal 8vo. 467 pp. Illus. (Leonard Hill [Books] Ltd., London.) 56*s*.

All over the world today the use of coffee as a beverage is well established. The appearance of a new and up-to-date book, in English, on the cultivation and production of coffee will be welcomed in many quarters. The author, who incidentally received his early horticultural or technical training at the hands of the R.H.S., has had wide practical experience of coffee in East Africa and has thus had a fund of first-hand experience on which to draw. This he has obviously supplemented by very wide reading for the literature on coffee is vast, although scattered and in many languages. His labours have resulted in a most useful and comprehensive work covering all aspects of the subject. It will without doubt fulfil the aims of the author, viz. "to supply the planter, the student and the field extension officer with an informative and interesting treatise in simple language".

The first few pages are devoted to a discussion of the early history of coffee, followed by descriptions of the different kinds of coffee or economic species of *Caffea* and what is known of their cytology, genetics and breeding. Most of the remaining eighteen chapters are devoted to the establishment, care and maintenance of coffee plantations. There are separate chapters on propagation, by seed and vegetative means, and on pests and diseases. The last part of the book deals with the economy of coffee production and production in the various coffee-growing countries of the world. The book is well illustrated and a selected bibliography is given at the end of each chapter. Some may wish that larger print had been used for these.

F. N. HOWES

"Plants of the Bible." By A. W. Anderson. 72 pp. Illus. (Crosby Lockwood 1956.) 21*s*.

Mr. Anderson, who must have carried out much research on this subject, deals with about twenty-four plants which are mentioned in the Bible and illustrates twelve in

colour. These plates, which are reproduced mainly from nineteenth-century works by such artists as Redouté, Bauer and others, are a little disappointing, as the colours are not quite true and much detail is lost, thereby making the figures look rather flat and toneless. The references are not always accurate; for example, the reference for Plate 5 should read: *Icones Florae Germanicae*, Vol. 10, not 2. In a book containing so many references, surely this is something which should be watched most carefully. The text, supported by Bible texts makes interesting reading and throws light on the customs of Biblical times, and on the uses and values of these plants.

"Die Rose." By M. Tantau and K. Weinhausen. 146 pp. Illus. (Eugen Ulmer, Stuttgart.) DM. 11.

This book is a bold attempt to deal within a volume of one hundred and fifty pages completely with every aspect of the development and cultivation of all types of roses. This task was rendered more difficult by the fact that the book is mainly intended for readers in Germany where in most regions the winter is too severe for many varieties. Part of the book is therefore devoted to instructions for protecting roses in winter, partly by burying them in earth heaps and partly by covering them completely with branches of evergreen. For the same reason the authors do not recommend the autumn thinning of established plants which is (or ought to be!) generally practised by rosarians in the United Kingdom.

The book deals fully and very clearly with the preparation of rose beds and the treatment and improvement of less suitable soils; in particular the instructions for dealing with excess and deficiencies in lime are excellent.

Fifteen pages of the volume contain lists of roses recommended for various purposes, but they include only a small number of varieties raised in England, Scotland and Ireland; it is astounding that not one rose raised by the house of McGredy is considered worthy of mention—but a place is found for dear old 'Mrs. John Laing'—well, well!

There is an interesting history of the development of the rose from the days of Homer to this century and there are a good number of coloured and black-and-white illustrations.

HERBERT OPPENHEIMER

"Malayan Orchid Hybrids." By M. R. Henderson and G. H. Addison. 191 pp. Illus. (Government Printing Office, Singapore.) $21 (31*s.* 6*d.*)

This book contains photographs of about 160 orchid hybrids raised or commonly grown in Malaya. In most cases there are two illustrations, both on the same page, one showing a single flower and one a whole inflorescence. The photographs are of excellent technical quality, and well displayed on pages of ample size (10 by 7 inches); there is one colour photograph, of *Vanda* 'Tan Chay Yan'. There is a brief description of each hybrid, with details of parentage, place of origin and original publication of name, and notes on local behaviour in growth and flowering. There are introductory sections on cultivation and propagation of each of the main classes of orchids concerned, namely dendrobium, the climbing vandas and their allies (hybrids of *Vanda*, *Arachnis*, *Renanthera*, *Vandopsis*, *Aerides* and *Phalaenopsis*), strap-leaved vandas, *Cypripedium* and *Spathoglottis*. The cultural notes give a clear and concise account of current practice in Singapore, with well-chosen photographic illustrations.

The aim of orchid breeding in Singapore during the past twenty-five years has been to produce plants which are both vigorous in growth and continuous in flowering in the very uniform equatorial climate. This aim has been most successfully achieved, and local growers have established a very high standard of cultivation, as may be judged from this book. Unfortunately, the book is already out of date; it is to be hoped that supplements, in the same style, may be produced. Both authors and publisher are to be congratulated on an excellent piece of work, which will be of great value to all who grow orchids in the tropics; it should also be of considerable interest to growers in other climatic regions.

R. E. HOLTTUM

Amateur Gardening Handbooks: No. 16, "Garden Pests and Diseases", by A. G. L. Hellyer; No. 17, "Fruit", by Howard H. Crane; No. 18, "Strawberries", by Norman Stewart. 92 pp. Illus. (Collingridge, 1956.) 4*s.* each.

These three handbooks make a useful addition to this series for amateurs and beginners. Mr. Hellyer gives descriptions of the main troubles and also lists the foes of particular plants. He, rather wisely, only commends the use of well-tried substances for spraying and dusting, omitting both the dangerous materials, and those

which have not yet had sufficient trial in this country. The book on Fruit seems to contain most of the points that its readers will need to consider, though in gardens where space permits it would be wise to increase the planting distances in nearly all cases.

Mr. Stewart treats his subject with considerable detail and this book makes a good "follow-on" to Mr. Crane's more general one.

G. E. PETERSON

"Vegetable Growing." By F. W. Loads. 96 pp. Illus. (W. & G. Foyle Ltd.) 3*s*.

For its size and price this book should prove useful to beginners. It contains most of the basic principles of vegetable growing, with the exception of one rather important omission—crop rotation. The author does not go into the importance of this practice which is so essential in vegetable growing. Some space, however small, should have been given to this subject.

"The Housewife Book of House Plants." By Zenia Field. 128 pp. Illus. (Hutton Press, 1956.) 8*s*. 6*d*.

The growing of house plants is becoming increasingly popular, but many enthusiasts meet with disappointment when they have had a plant in their homes for a week or two. Miss Field devotes nearly half her book to the care and management of these plants and provides the answers to many problems. The rest of the book is concerned with the requirements of particular plants which are classified according to the ease with which they can be grown in what are after all very unnatural conditions.

"Saints and their Flowers." By Gladys Taylor. 108 pp. Illus. (Mowbray, London, 1956.) 10*s*. 6*d*.

A charming little book in which many of the countless legends concerning the saints and flowers are told and these stories, many of them not well known, add interest to the plants that we know so well. Eight illustrations from the Old Masters and pen sketches illustrate the chapters which are each devoted to particular aspects of the flowers and their saintly associations.

"Investigation of Virus Diseases of Brassica Crops." By L. Broadbent. Agricultural Research Council Report Series No. 14. vii + 87 pp. (Cambridge University Press, Feb. 1957.) 15*s*.

The bulk of this book is occupied by summaries of experiments on the effect of infection with the viruses of Cauliflower Mosaic and Brassica Ring Spot on brassica crops in England from 1951 to 1954. During these years the former virus was much more prevalent in field crops than the latter. The diseases produced by both viruses, singly and together, in the more important brassica crops are briefly described and illustrated by photographs, often on rather too small a scale to show the symptoms to the best advantage. There is an impressive list of cultivated and wild host species, only cruciferous plants for Cauliflower Mosaic Virus but including flowering plants of many families for Cabbage Ring Spot Virus. Field evidence indicates that of the many possible aphid vectors only *Myzus persicae* and *Brevicoryne brassicae* are important agents in the spread of these viruses in England. Heavy nitrogenous manuring increased plant susceptibility to Cauliflower Mosaic Virus, increased the rate at which symptoms developed and also their severity. Young plants are easier to infect than old ones and the earlier the plants are infected the greater is the loss in crop. Moreover, transplanting infected seedlings is a common method by which the diseases are introduced into field crops. There is little evidence that rogueing the field stands will be worth while and the control measures suggested relate mainly to the seed-beds. These should be sited well away from overwintering brassica crops and considerable reduction in incidence of virus diseases has been obtained by surrounding the seed-beds with narrow barriers of taller crops, preferably of cereals. A brief account is also given of brassica diseases caused by Cucumber Mosaic Virus, transmitted by aphides, and by the viruses of Turnip Yellow Mosaic and Turnip Crinkle, both transmitted by flea-beetles.

R. W. G. DENNIS

"Amateur Gardening Spring Guide." Edited by A. G. L. Hellyer. 118 pp. Illus. (Amateur Gardening.) 6s.

This paper-covered volume contains a fine selection of short illustrated articles by such authorities as the late A. T. Johnson on summer-flowering shrubs, rock-garden plants by Will Ingwersen, Floribunda roses by Bertram Park and newer irises by H. J. Randall, to mention only a few. Fruit and vegetable growing is covered also and the whole represents a stimulating miscellany in which almost any gardener would find something of interest. The coloured illustrations, particularly the one of Michaelmas daisies in the Savill Gardens at Windsor, are unusually attractive.

PATRICK M. SYNGE

"Soils and Soil Fertility." By Louis M. Thompson, Ph.D. 2nd Edition. 451 pp. Illus. (McGraw Hill, New York, 1957.) £2 9s.

This book should prove useful to students in all agricultural colleges but more so to those in the American colleges. The soil survey relates only to the U.S.A. and while general scientific principles relating to the structure and composition of soils are of universal application the treatment given to improve fertility is specifically applied to the U.S.A. where climatic conditions differ widely from those in this country.

The physical properties of soils are dealt with very thoroughly as also is the importance of soil structure in the top spit (A horizon) and the subsoil (B horizon), though a fair knowledge of chemistry is evidently assumed.

The chapter dealing with soil moisture, its measurement, movement, and its relationship to fertility is interesting and convincing and much is of general interest.

Clay minerals, acidity and alkalinity, the relative anion exchange capacity to that of the cation exchange capacity as a means of distinguishing between the older and younger days are fully treated and the subject-matter will be most useful to advanced students.

The use of lime, as well as the abuse, is specially related to the crops grown in the U.S.A. and much will not apply in Britain, but the scientific principles involving anion and cation exchange will be helpful to all students. Space is found to include the structure and function of chelates as a means of adding trace elements to soils and their effectiveness in controlling chlorosis under acid and under calcareous conditions. A useful reference book.

F. FAIRBROTHER

"Soil Fertility and Fertilisers." By Samuel Tisdale and Werner L. Nelson. 430 pp. Illus. (The Macmillan Company, New York, 1957.) 45s.

Students with a sufficiently good knowledge of mathematics, chemistry and biology should find this book most valuable, but it is not a book for the beginners.

It is described in the preface as being suitable for junior and senior levels in an Agricultural College—it is therefore a little surprising to find an equation on differential on p. 24.

The historical introduction provides an interesting and useful background for the study of soil fertility. Factors affecting the growth of plants are briefly listed. The chapters dealing with the chemical elements required for plant nutrition are clearly written and it is good to see that stress is laid on the ionic absorption of the various basic and acidic radicals.

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F. FAIRBROTHER

ERRATUM

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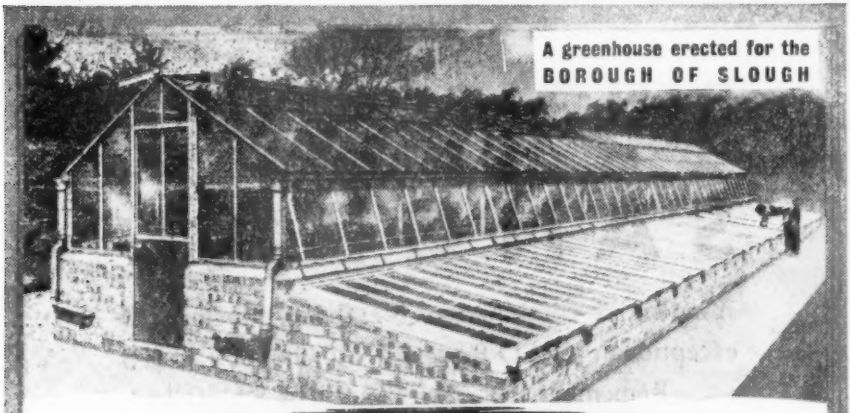

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PATRICK M. SYNGE

"Soils and Soil Fertility." By Louis M. Thompson, Ph.D. 2nd Edition. 451 pp. Illus. (McGraw Hill, New York, 1957.) £2 9s.

This book should prove useful to students in all agricultural colleges but more so to those in the American colleges. The soil survey relates only to the U.S.A. and while general scientific principles relating to the structure and composition of soils are of universal application the treatment given to improve fertility is specifically applied to the U.S.A. where climatic conditions differ widely from those in this country.

The physical properties of soils are dealt with very thoroughly as also is the importance of soil structure in the top spit (A horizon) and the subsoil (B horizon), though a fair knowledge of chemistry is evidently assumed.

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Clay minerals, acidity and alkalinity, the relative anion exchange capacity to that of the cation exchange capacity as a means of distinguishing between the older and younger days are fully treated and the subject-matter will be most useful to advanced students.

The use of lime, as well as the abuse, is specially related to the crops grown in the U.S.A. and much will not apply in Britain, but the scientific principles involving anion and cation exchange will be helpful to all students. Space is found to include the structure and function of chelates as a means of adding trace elements to soils and their effectiveness in controlling chlorosis under acid and under calcareous conditions. A useful reference book.

F. FAIRBROTHER

"Soil Fertility and Fertilisers." By Samuel Tisdale and Werner L. Nelson. 430 pp. Illus. (The Macmillan Company, New York, 1957.) 45s.

Students with a sufficiently good knowledge of mathematics, chemistry and biology should find this book most valuable, but it is not a book for the beginners.

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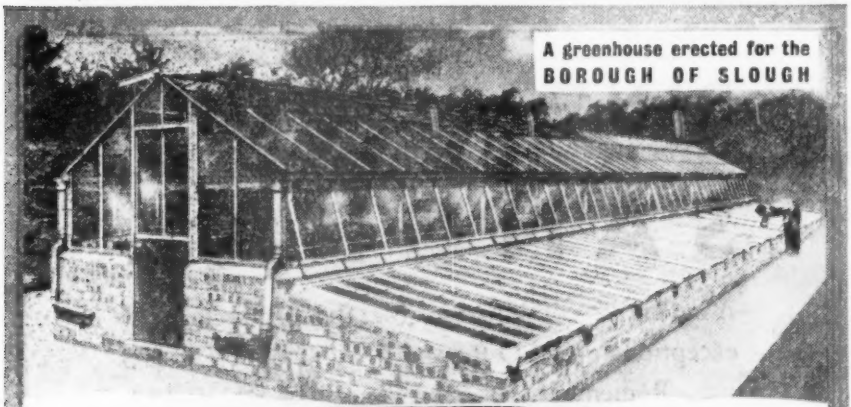

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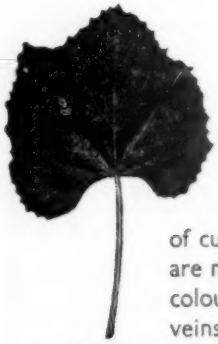

Yields of grapes may be appreciably reduced through deficiency of manganese. Left is a picture showing a normal Concord grape leaf and right from a vine seriously deficient in manganese. Symptoms first appear on the leaves at the base of current season's growth. They are marked by an absence of green colouring matter between the veins of the leaf which gives a mottled appearance. The intervenal areas become light yellow-green in colour while the veins and some of the tissue nearest to them retain a normal dark green colour.

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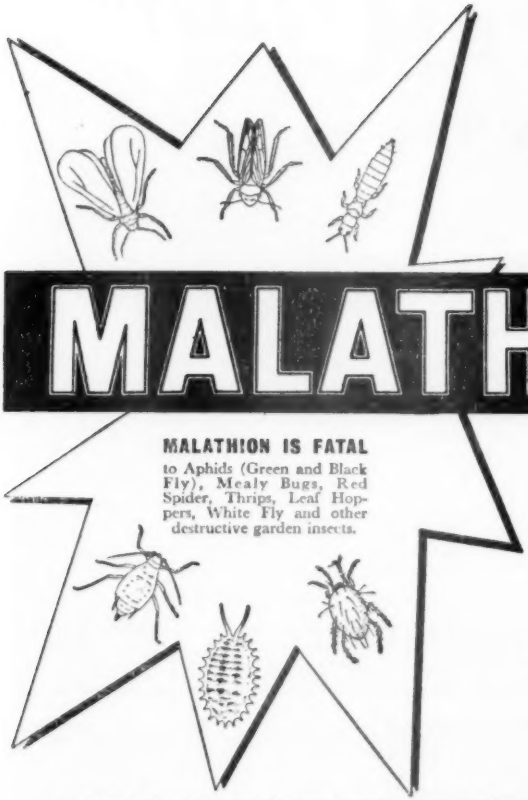

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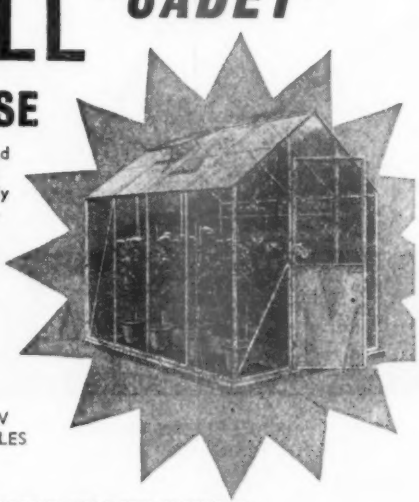

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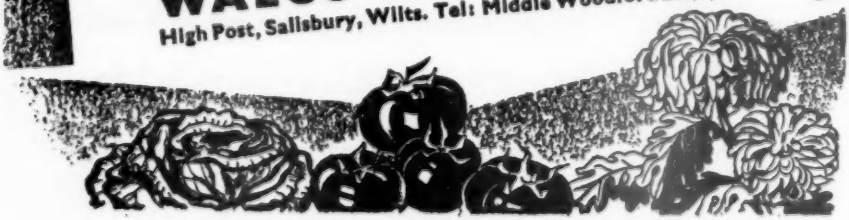

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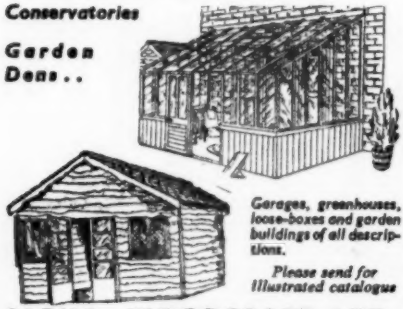

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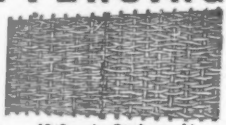

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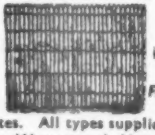

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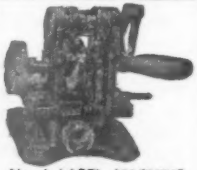

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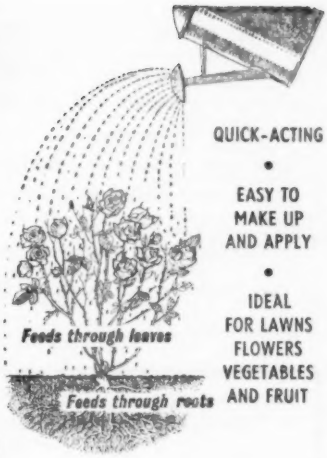

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4 ft.	12 6	15 0	25 0	30 0
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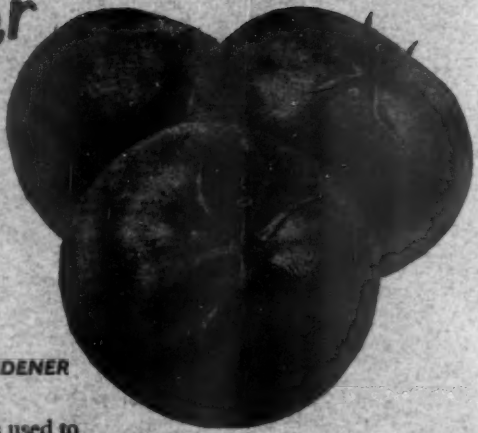

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